

2001 NW 19th Avenue, Suite 200 | Portland, OR 97209 | 971 544-2139 | www.maulfoster.com

April 15, 2015 Project No. 8128.01.08

Mr. Dana Bayuk Oregon Department of Environmental Quality 2020 SW 4th Avenue Portland, Oregon 97201-4987

Re: Monitoring Wells WS-11 and WS-14 Abandonment Report Siltronic Corporation 7200 NW Front Avenue, Portland, OR ECSI No. 183

#### Dear Dana:

On behalf of Siltronic Corporation (Siltronic), Maul Foster & Alongi, Inc. (MFA) has prepared this letter documenting the abandonment of nested monitoring well pairs WS-11 and WS-14 at the Siltronic property.

Direction to abandon WS-14 was provided in DEQ's January 28, 2014, e-mail correspondence to Siltronic documenting a January 27, 2014, telephone conversation. An initial version of the work plan was submitted to DEQ on February 14, 2014, to which DEQ responded in an e-mail dated April 10, 2014. DEQ's April 10 e-mail informed Siltronic that there were insufficient details regarding the well abandonment procedures and provided their approval to proceed with the well inspection video logging for WS-14-125/161 to support scoping and planning of the abandonment work.

The video logs were submitted to DEQ on April 25, 2014 and show the joints in the WS-14 well pair to be intact. The video logs also documented the entry of dense, non-aqueous phase liquid (DNAPL) characteristic of manufactured gas plant (MGP) operations in portions of the well screens, and accumulation of MGP waste DNAPL in the well sump of WS-14-125. At that time, only the WS-14 well pair was scheduled for abandonment. In a DEQ e-mail dated June 25, 2014, DEQ responded with comments and directed Siltronic to also abandon well pair WS-11-125 and WS-11-161.

MFA incorporated DEQ comments in a revised work plan submitted on July 25, 2014. On September 18, 2014, DEQ responded with comments in a letter regarding "Abandonment of the WS-11 and WS-14 Monitoring Well Clusters and Installation of a Deep Monitoring Well" and requested that a revised work plan be submitted to DEQ by October 6, 2014. To expedite DEQ's review, MFA provided a draft of the revised text to DEQ on October 6, before production of the final document. DEQ responded in a letter on October 22 with their approval of the final document and implementation, subject to incorporation of their comments.

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MFA provided a Final Revised Monitoring Wells WS-11 and WS-14 Abandonment Plan dated November 7, 2014 which was a revision of previous versions and incorporated DEQ's September 18 and October 22 comments. The Final Revised Monitoring Wells WS-11 and WS-14 Abandonment Plan was approved by DEQ in a December 10, 2014 e-mail.

#### **BACKGROUND**

The nested monitoring well pairs WS-14 and WS-11 are located near the north (plant northwest) corner of the Siltronic property, as shown in the attached figure. The wells were completed in October 2003 (WS-11) and July 2004 (WS-14). The monitoring well construction logs are included in Attachment A.

The monitoring well pair WS-11 is identified by OWRD as well log ID "MULT 72126" (i.e., Startcard No. 147655 and Well ID No. 67076). For monitoring well pair WS-14, the OWRD log "MULT 73686" reports the well number as WS-13, but the reported well number appears to be incorrect. The OWRD well log "MULT 73686" (i.e., Startcard No. 164731 and Well ID No. 73526) is the correct file for WS-14. The OWRD well logs are included in Attachment A.

#### FIELD ACTIVITIES

Public and private utility-locating services were used to check for underground utilities before well abandonment drilling activities began at WS-11 and WS-14. Additionally, an air knife was used around WS-11 and WS-14 to a depth of 10 feet below ground surface (bgs) to verify clearance from potential subsurface obstructions. The field work related to the decommissioning began on January 28, 2015 and ended on February 12, 2015.

On January 26, 2015, depth to water, depth to bottom, and depth to MGP waste DNAPL measurements were recorded (see the following table), and approximately 2 gallons of a MGP waste DNAPL/groundwater mixture was removed from WS-14-125, using a new, single-use bailer.

Dana Bayuk April 15, 2015 Page 3

Well	DTW (feet below TOC)	DT-DNAPL (feet below TOC)	DTB (feet below TOC)
WS-11-125	24.55	T	124.65
WS-11-161	24.44	NP	160.80
WS-14-125	24.74	122.40 <sup>a</sup>	125.20
WS-14-161	24.68	158.75 to 158.80	158.90

#### NOTES:

DT-DNAPL = depth to MGP waste DNAPL.

DTB = depth to bottom.

DTW = depth to water.

NP = MGP waste DNAPL not detected using interface meter; no MGP waste DNAPL observed on interface meter.

T = trace MGP waste DNAPL.

TOC = top of casing.

<sup>a</sup> Unable to obtain consistent measurement using interface meter. A new, single-use bailer showed approximately 2.8 feet of MGP waste DNAPL following deployment to the bottom of the well. DT-DNAPL obtained by subtracting 2.8 feet from DTB measurement.

Cascade Drilling, L.P. of Clackamas, Oregon performed the monitoring well abandonment by overdrilling using a rotosonic drilling rig.

The monitoring well abandonments were conducted in accordance with applicable regulations, MFA's November 7, 2014 Final Revised Monitoring Wells WS-11 and WS-14 Abandonment Plan, and an OWRD variance (i.e., special standard request approval) for each nested well pair. The approved special standard requests are included in Attachment B.

#### WS-11

A 10-inch diameter casing and 8-inch diameter core barrel were used to remove materials from ground surface to 130 feet bgs, approximately 5 feet below the bottom of the filter pack for WS-11-125. Subsequently, an 8-inch diameter casing and 6-inch diameter core barrel were used to remove materials from 130 feet bgs to 166 feet bgs, approximately 5 feet below the bottom of the filter pack for WS-11-161. No evidence of MGP waste DNAPL was observed in the material retrieved from below the bottom of the filter pack; therefore, drilling was terminated at 166 feet bgs, and bentonite/organoclay-bentonite borehole sealing proceeded. Gravel was used as surface completion to match the surrounding area.

The basis for the placement of the organoclay-bentonite grout was a combination of information from the WS-11 well installation log; boring logs for MW-36U, PW-2L/PW-2U, OW-2F, and GP-4; the TarGOST® log from nearby TG-PW2-130; and observations made during the overdrilling (abandonment) of WS-11. Observations that indicate the likely presence of MGP waste DNAPL (including hydrocarbon-like odors) were noted during the abandonment activities from 10 to 36 feet bgs and 106 to 146 feet bgs. Consistent with the video log observations, MGP waste DNAPL (i.e., staining) was only noted within the screened interval for WS-11-125. A 3-foot buffer of organoclay bentonite grout was placed on either side of the depths intervals where MGP waste DNAPL had the potential to occur.

The following table summarizes WS-11 borehole sealing material depths, volume/amount of material used, and mud-weight measurements.

WS-11 Borehole Sealing									
Depth (feet bgs)	Backfill Material	Amount	Mudweight (lbs/gallon)						
0 to 3	Pea Gravel	35 50-lb bags	NA						
3 to 7	Bentonite Chips	18 50-lb bags	NA						
7 to 39	Organoclay-Bentonite Grout	315 gallons	9.7 to 9.9						
39 to 103	Bentonite Grout	300 gallons	9.6 to 10.0						
103 to 149	Organoclay-Bentonite Grout	495 gallons <sup>a</sup>	9.6 to 9.9						
149 to 166	Bentonite Grout	46 gallons	10.0 to 10.1						

NOTES:

feet bgs = feet below ground surface.

lbs = pounds.

NA = not applicable.

#### WS-14

A 12-inch diameter casing was placed from 1 foot above ground surface to 19 feet bgs. A 10-inch diameter casing and 8-inch diameter core barrel were used to remove materials from ground surface to 130 feet bgs, approximately 5 feet below the bottom of the filter pack for WS-14-125. Subsequently, an 8-inch diameter casing and 7-inch diameter core barrel were used to remove materials from 130 feet bgs to 186 feet bgs, approximately 25 feet below the bottom of the filter pack for WS-14-161. There was no recovery of soil (which was observed in the field during abandonment activities to make a determination for the use of organoclay bentonite grout) from 130 to 173 feet bgs, so the core barrel was advanced to 186 feet bgs. No observations that indicate the likely presence of MGP waste DNAPL (including hydrocarbon-like odors) were observed between 173 and 186 feet bgs; therefore, drilling was terminated at 186 feet bgs, and bentonite/organoclay-bentonite borehole sealing proceeded. Gravel was used as surface completion to match the surrounding area.

The basis for the placement of the organoclay-bentonite grout was a combination of information from the WS-14 boring log from the monitoring well installation; boring logs for P-1, MW-35U, GP-99, PW-2L/PW-2U, OW-2F, and GP-4; the TarGOST® logs from nearby TG-12S and TG-PW2-130; and observations made during the overdrilling (abandonment) of WS-14. For WS-14, it was determined that the potential presence of MGP waste DNAPL (including hydrocarbon-like odors) may occur between 6 and 130 feet bgs. Consistent with the video log observations, MGP waste DNAPL (i.e., staining) was only noted within the screened intervals of WS-14-125 and WS-14-161. To account for the potential presence of MGP waste DNAPL in the interval of no recovery (from 130 to 173 feet bgs), organoclay-bentonite grout was used to seal this interval to 176 feet bgs. Similar to

<sup>&</sup>lt;sup>a</sup> The 10-inch diameter casing became stuck during the borehole sealing; this interval was regrouted after the 10-inch diameter casing was released; 495 gallons represents the total amount of grout used, including regrouting.

WS-11, a 3-foot buffer of organoclay bentonite grout was placed on either side of the depths intervals where MGP waste DNAPL had the potential to occur. The following table summarizes WS-14 borehole sealing material depths, volume/amount of material used, and mud-weight measurements.

	WS-14 Borehole Sealing									
Depth (feet bgs)	Backfill Material	Amount	Mudweight (lbs/gallon)							
0 to 2	Pea Gravel	15 50-lb bags	NA							
2 to 3	Bentonite Chips	8 50-lb bags	NA							
3 to 176	Organoclay-Bentonite Grout	1012.5 gallons	9.7 to 9.9							
176 to 186	Bentonite Grout	30 gallons	10.0							

NOTES:

feet bgs = feet below ground surface.

lbs = pounds.

NA = not applicable.

#### INVESTIGATION-DERIVED WASTE

Materials generated during the monitoring well abandonments were characterized and managed consistent with the procedures established for investigation-derived waste generated in the TCE Contaminated Material Management Area, as necessary. The waste characterization laboratory analytical reports are included in Attachment C and waste disposal manifests are included in Attachment D.

Please call or e-mail if you have any questions regarding this submittal.

Sincerely,

Maul Foster & Alongi, Inc.

Kerry Cathlin Gallagher

Project Scientist

James G.D. Peale, RG

Principal Hydrogeologist

Attachments: Figure

A—Well Logs

B—Special Standards

C—Laboratory Analytical Reports

D-Waste Disposal Manifests

cc: Myron Burr, Siltronic Corporation

Ilene Gaekwad and William Earle, Davis Rothwell Earle & Xochihua, P.C.

Chris Reive, Jordan Ramis

## **FIGURE**





Source: Aerial photograph obtained from Esri ArcGIS Online.

Note:

Locations are approximate and shown for reference only.



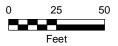
This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

### Legend

- Geoprobe Location
- NW Natural Well
- ◆ TarGOST Boring
- Siltronic Tax Lot

# Figure Monitoring Well WS-14 and WS-11 Locations

Siltronic Corporation Portland, Oregon





## ATTACHMENT A

WELL LOGS



### **MULT 118591**

Amended #2 3/20/15

Page 1 of 3

STATE OF OREGON MONITORING WELL REPORT

(as required by ORS 537.765 & OAR 690-240-0395)

2/26/2015

WELL I.D. LABEL# L \_ 67967

START CARD # 1025433

(1) LAND OWNER Owner Well I.D. WS-13 WS14	(6) LOCATION OF WELL (legal description)
First Name Last Name	County MULTNOMAH Twp 1.00 N N/S Range 1.00 W E/W WM
Company SILTRONIC CORPORATION	Sec 13 NW 1/4 of the NW 1/4 Tax Lot 1200
Address 7200 NW FRONT AVE	Tax Map Number Lot
City PORTLAND State OR Zip 97210	Lat o or or DMS or DD
(2) TYPE OF WORK New Deepening Conversion	Long or DMS or DD  Street address of well Nearest address
Alteration (repair/recondition) Abandonment	7200 NW FRONT AVE, PORTLAND OR
(3) DRILL METHOD	1200 IN TROM IND, CARDING OR
Rotary Air Rotary Mud Cable Hollow Stem Auger Cable Mud	(7) STATIC WATER LEVEL
Reverse Rotary X Other SONIC	Date SWL(psi) + SWL(ft)
(4) CONSTRUCTION Piezometer Well	Existing Well / Predeepening  Completed Well
Depth of Completed Well 186,00 ft. Special Standard	Flowing Artesian? Dry Hole?
	WATER BEARING ZONES Depth water was first found
MONUMENT/VAULT	SWL Date From To Est Flow SWL(psi) + SWL(ft)
FromTo	
BORE HOLE	
Diameter +0 12 From 0 To +30 19	
CASING	(8) WELL LOG Ground Elevation
Dia. From To	Pea gravel Material 0 From 2 To
Gauge Wid Thrd	Chips
Material Steel Plastic	Organo Clay 3 4 176
LINER	Aqua Guard 176 186
Dia. From To	
Gauge Wid Thrd	RECEIVED BY OWRD
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From To	APR 0 1 2015
Material	
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SCREEN	
Casing/Liner Material	
Diameter From To Slot Size	
SIOI SIZE	Date Started 2/13/2015 2/5/2015 completed 2/13/2015 2/12/2015
FILTER	(unbonded) Monitor Well Constructor Certification
From To Material Size of pack	I certify that the work I performed on the construction, deepening, alteration, or
	abandonment of this well is in compliance with Oregon monitoring well construction standards. Materials used and information reported above are true to
(5) WELL TESTS	the best of my knowledge and belief.
Pump Bailer Air Flowing Artesian	License Number 10329 Date 2/26/2015
Yield gal/min Drawdown Drill stem/Pump depth Duration (hr)	Password : (if filing electronically)
	Signed RODNEY LABROSSE SR (E-filed)
	(bonded) Monitor Well Constructor Certification
Temperature °F Lab analysis Yes By	I accept responsibility for the construction, deepening, alteration, or abandonment
Supervising Geologist/Engineer	work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon monitoring well
Water quality concerns? Yes (describe below)	construction standards. This report is true to the best of my knowledge and belief.
From To Description Amount Units	License Number 10306 Date 2/26/2015
	Password: (if filing electronically)
	Signed JTRENT CASTNER (E-filed) Contact Info (optional) Cascade Drilling
	Common and (Optionar) Cascade Dillillig

#### **MULT 118591**

**MONITORING WELL REPORT** continuation page

WELL I.D. LABEL#+ 67967.

Page 2 of 3

START CARD # 1025433

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(7) STATIC WATER	LEVEL
Water Bearing Zones	

SWL Date	From	То	Est Flow	SWL(psi)	+ SWL(ft)
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		-			H-

#### (8) WELL LOG

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	RECEIVED		
	APR 01	2015	
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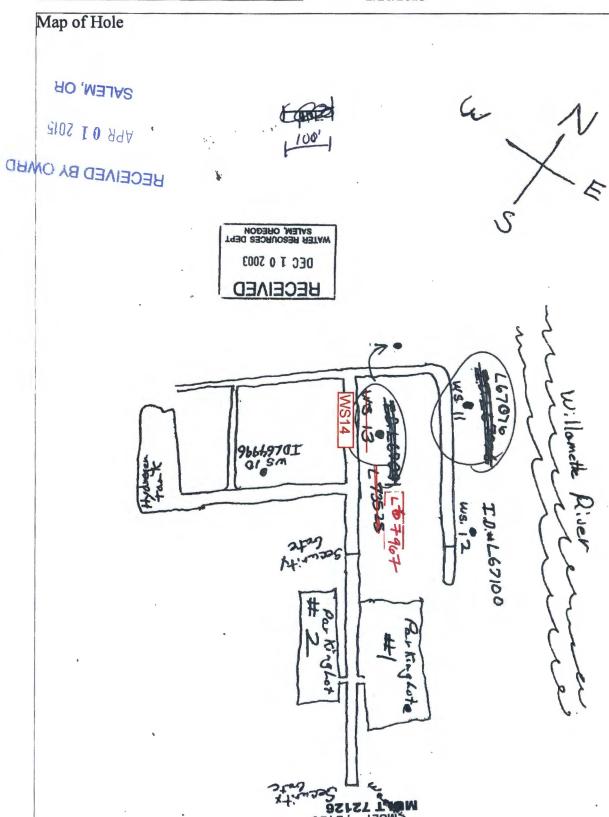
#### Comments/Remarks

Over Drilled nested well, Special Standard - used Organo Clay in Sealing hole.

THE WELL LABEL L67967 WAS THE ACTUAL LABEL ON THE WELL, EVEN THOUGH THE LABEL WAS INCORRECTLY FILED FOR A WELL IN KLAMATH CO.

MONITORING WELL REPORT - Map with location identified must be attached and shall include an approximate scale and north arrow

2/26/2015



STATE OF OREGON MONITORING WELL REPORT

(as required by ORS 537.765 & OAR 690-240-0395)

2/26/2015

WELL I.D. LABEL# L 67076 START CARD # 1025432

Alteration (repair/recondition)  Abandonment  (3) DRILL METHOD  Rotary Air Rotary Mud Cable Hollow Stem Auger Cable Mud  Reverse Rotary Other SONIC  (4) CONSTRUCTION  Piezometer Well Completed Well 166.00 ft Special Standard Completed Well 166.00 ft Special Standard Completed Well Special Standard Completed Well 166.00 ft Special Standard Completed Well Special Sp	
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Alteration (repair/recondition) Abandonment  (3) DRILL METHOD  Rotary Air Rotary Mud Cable Hollow Stem Auger Cable Mud  Reverse Rotary Other SONIC  (4) CONSTRUCTION  Piezometer Well Completed Well According to Special Standard Completed Well Special Special Standard Completed Well Special Spec	
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Rotary Air Rotary Mud Cable Hollow Stem Auger Cable Mud Reverse Rotary Other SONIC  (4) CONSTRUCTION  Piezometer Well Completed Well Accepted Special Standard Completed Well Special Standard Completed Well Completed	
Reverse Rotary Other SONIC  (4) CONSTRUCTION  Piezometer Well  Completed Well 16600 ft Special Standard Vell 16600 ft Special Standard Special Standard Special Standard Special Standard	
(4) CONSTRUCTION  Piezometer Well  Completed Well 16600 ft Special Standard V	
Completed Well 166 on the Special Standard V	
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BORE HOLE	_
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CASING  (8) WELL LOG  Ground Elevation	
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Aqua Guard 39 103	
LINER Organo Clay 103 149	
DiaFromTo	
Gauge Wid Thrd RECEIVED BY OWNER	
Material Steel Plastic	-
SEAL APR 0 1 2015	
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Amount Grout weight SALEM, OR	
SCREEN	$\dashv$
Casing/Liner Material	
Diameter From To	-
Date Started 2/13/2015 1/28/2015 ompleted 2/13/2015 2/4/2	015
	313
FILTER from ' To Material Size of pack (unbonded) Monitor Well Constructor Certification I certify that the work I performed on the construction, deepening, alterat	n or
abandonment of this well is in compliance with Oregon monitoring	well
(5) WELL TESTS construction standards. Materials used and information reported above are the best of my knowledge and belief.	rue to
Pump Bailer Air Flowing Artesian License Number 10329 Date 2/26/2015	
Yield gal/min Drawdown Drill stem/Pump depth Duration (hr)  Password: (if filing electronically)	
Signed RODNEY LABROSSE SR (E-filed)	_
(bonded) Monitor Well Constructor Certification	
Temperature °F Lab analysis Yes By I accept responsibility for the construction, deepening, alteration, or abando work performed on this well during the construction dates reported above	
Supervising Geologist/Engineer work performed during this time is in compliance with Oregon monitorin	well
Water quality concerns? Yes (describe below) construction standards. This report is true to the best of my knowledge and because the construction standards.	:lief.
From To Description Amount Units License Number 10306 Date 2/26/2015  Password: (if filing electronically)	
Signed J TRENT CASTNER (E-filed)	_
Contact Info (optional) Cascade Drilling	

## continuation page

**START CARD # 1025432** 

#### 2/26/2015

(4) C(	ONSTRU	UCTION	1					
В	ORE HO	LE	FI	FILTER PACK				
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#### **SCREENS**

Perf/	Casing/	Screen			Scrn size/	Slot	# of	Tele/
Screen	Liner	Dia	From	То	slot width	length	slots	pipe size
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#### (5) WELL TESTS

Yield gal/min	Drawdown	Drill stem/Pump depth	Duration (hr)
1	1		

#### **Water Quality Concerns**

From	To	Description	Amount	Units

#### (7) STATIC WATER LEVEL

**Water Bearing Zones** 

SWL Date	From	То	Est Flow	SWL(psi)	+ SWL(ft)
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#### (8) WELL LOG

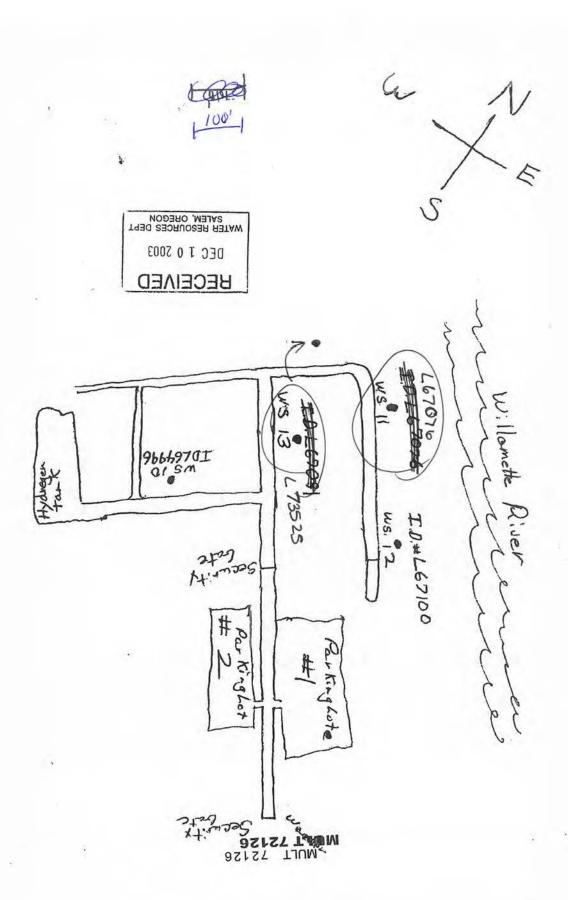
Material	From	То
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#### Comments/Remarks

Over Drilled nested well, Special Standard - us	used Organo Clay in Sealing hole.
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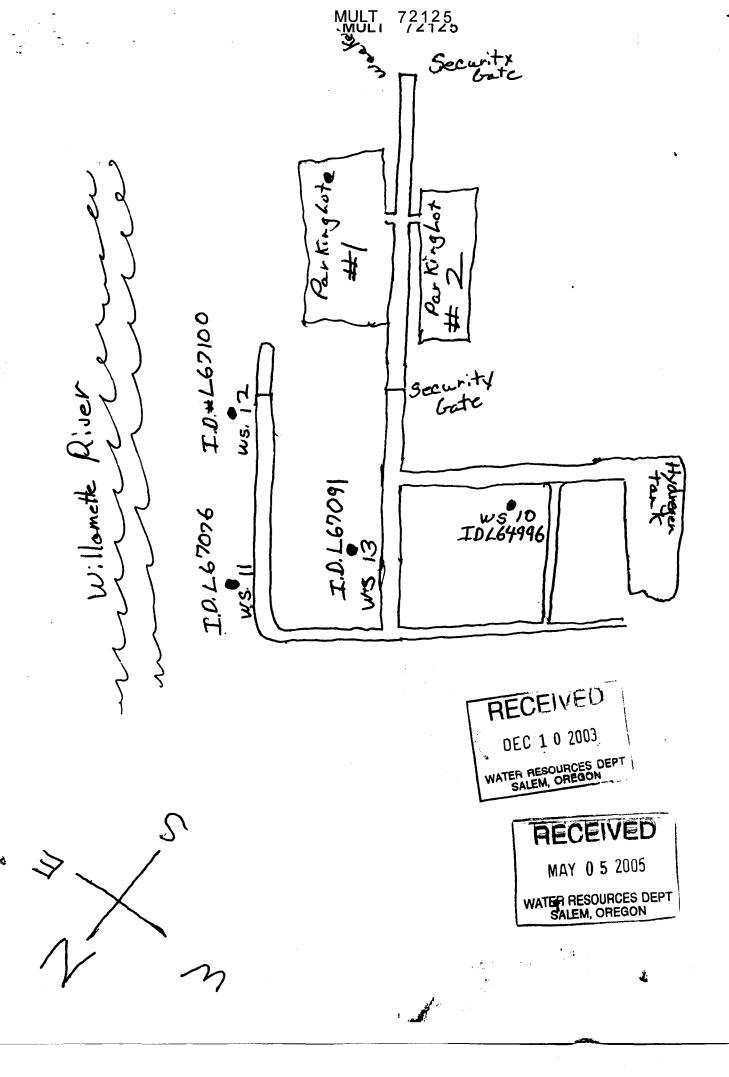
2/26/2015

Map of Hole



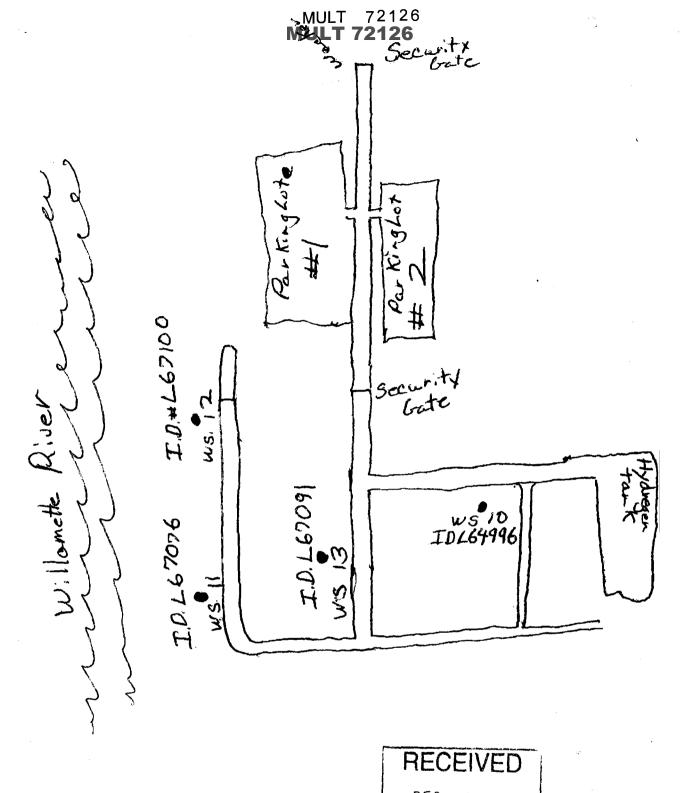
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Instructions for completing th							·		
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Yes No	Depth of completed	SALEM, ORE		o at which	h water was fir		Flow Rate		SWL
Special Standards	Deput of completed	Land surface		4	105	Est.	5	7	9.3
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87 ft   500 m	3 88	- Well seal:	<u>مان</u> م	rí	<del></del>	14	211		
000	3 111112	Material Berovic	40ml			ack	File	f the	<u>u</u>
2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 1111/2007	Amount Crout weight	CHAS I'M	MAY	e pipe	3ron	207	70 16	<u> </u>
5,2	3 0 0 C	Borehole diameter		<i>m</i> _	acrea,	DEAGE	VILLE A	rever	
		in.							
_ 000	2005	Bentonite plug at least	3 ft. thick	€ E	roma !	651	112'L	vith_	10.0
Filter cas cas	1 2000	Screen	1/0	Gre	w.T		ļ	<del> </del>	ļ <b>.</b>
pack 000		interval(s):	6 Spel	00/00	1121	105	with	Coat	-
34n. 30,00	1 50°2	From 489 To 10	4 0	Ilet	11/70	100	20.47	COLL	
To ⟨ , , , , , , , , , , , , , , , , , ,	目 5%3	From To		<del></del>				·	
105 tt 000	B 80 8	Slot size / D in	·						
2000	विकित्र विकास	—Filter pack:			<del></del>	3		<u> </u>	
000	9000	Material Sold in	Date s	aned L	0-3-0		Completed	10-21	-03
6003	<u> </u>	1' sunt 104'-			itor Well Const				
' (5) WELLTEST:	•				he work I perfo this well is in c				
Pump Bail		Flowing Artesian		s. Mater Ige and b	ials used and i	nformation	* /		
Permeability U.K.	Yield	GPM						1 1	10192
Conductivity 5470 Temperature of water 14.7	S/Cm PH 6.	esian flow found hon	Signed_ fr.		wa p	org		Date 10-	21-67
Was water analysis done?		1011	(bonded		r Well Constru				
By whom?					nsibility for the on this well du				
Depth of strata to be analyze	ed. From	ft. to	ft. work pe	formed o	during this time	e is in comp	pliance with O	regon well o	construction
Remarks:			standard	This r	eport is true to	the best of	` '		10127
Name of supervising Geolog	vist/Engineer		/	$\forall$	The state of	W _	/	WC Number	11. AS
• • •		R RESOURCES DEPART	Signed MENT SECON	CON	-CONSTRUC	TOR THI	RD COPY-CU	JSTOMER	
					uk.	<b></b>			

MONITORING WEL (as required by ORS 537.765 & C	EUN L REPORT DAR 690-240-095)	Page 2 MULT	7212 /212	5 Sta	rt Card	670 #W15	91	,	
(1) OWNER/PROJECT:		t page of this form.		OCATIO	ON OF	WELL By	legal descr	iption	
Name Wacker	<u>~</u> 1 A		Well L	ocation: C		Yustr			<u>, ~</u>
Address 7200 N.W.			Townsh	ip <b>/ N</b>		or S) Range			1 13
City Portland	State 0	Zip 97210							Front
(2) TYPE OF WORK:			A		ertle		<u> </u>	14.0	<u> </u>
New construction	Alteration (Repa	ir/Pecondition)					200		
Conversion	Deepening	Abandonment				LOCATION		Man chal	Linclude
Conversion	Deepening					orth arrow.	DENTIFIED	. Map shar	i include
(3) DRILLING METHOI  Rotary Air	Rotary Mud	☐ Cable	(7) ST			LEVEL: d surface.	Date /î	)-21-	^3
<u> </u>	Other Son		Artesia			lb/sq. in.			
BORE HOLE CONST	RUCTION		(8) W	ATER B	EARI	NG ZONES	i:		
Yes No	•	100	Depti	at which	water wa	s first found			
Special Standards	Depth of completed	well 67 ft.	F	rom	То	Est.	Flow Rate		SWL
		Land surface	<u> </u>						7
Vault (2)			8	34	105	ي./		2	9.3
Oft.	'	Water-tight cover	/	22	207	2.0	<u> </u>		'.K.
		Surface flush vault							
ft.   9	<b>⊲</b>	— Locking cap	<u> </u>	<u></u>					
	2	Casing	(9) W	EĽŁLO	G:	Ground ele	vation		<del></del> .
( 3032	1111 S o 8 h	<del></del>	n				<del>,</del>		7
5,0	## 5° 0	material P.U.C.	-	Materi	al ·		From	To	SWL
200	100 m	Welded Threaded Glued						1	<u> </u>
	280		20/	ty CI	QX_		2	58	
1.5 ft. ODO	1111 00 S	Liner	31	tyse	المرجيد	it h	58	170	
1.0 tr   0000	8000	diameter none in	1.	pers !	0 <del>5</del> Sq	may	100	7//	
		material	- 159	SOFT, Y	vagn	hened	203	203	1
το. <	111111111111111111111111111111111111111	Welded Threaded Glued	130	asalt	<u>U</u>	ay	203	207	7
49 6	Mon o	- Well seal:	<u> </u>						<del> </del>
"   08 5	08 8 P	Material Bestonit Grav	+		_				<del>                                     </del>
		Amount 250 Chy	3,10		ᇤ				<del></del>
0 = 0	0 ≈ 0 €	Grout weight 10.0		<u> </u>	Oz				
S C	000	Borehole diameter		<del>- 20</del>	<b>108</b>	DEC	FIVED		
000		in.		70	달분기	TILVI	. 1 7		
	100 P	Bentonite plug at least 3 ft. ti	hick 1	-6	ਫ਼ੁਖਾ	DFC 1	0 2003		
Og Qg	า เกิด เกิด	Screen Screen	0	>-	100 H	UEU 1	U 2003		<u> </u>
Filter 08°0	d GR G	materia Baixless	- 1			WATER RES	DURCES DI	PT	
pack	800	interval(s):				SALEM.	OREGON		
TPP PDOG	100°09	From <b>52.5</b> To <b>67.5</b>	- 1'		<u></u>				
70 \ 5000	E 2000	FromTo							
69 n   90 9	808	Slot size 10 in.							
multi See		Filter pack:							
well on a	10 % o	Material Solko	_ Date st	arted	<u> 0-3</u>	-03	Completed	10-21	-03.
292021 [08.09 ]	] ୍ବିଷ୍ଟ୍ରେମ୍ବ	Size 10-20 in.	~ <b>/</b> (hand	ad\ Manito	- W-11 Ca		· Carrian		,
2 701	18009	samp 675+0682				enstructor Certi erformed on th		, alteration,	or
(5) WELLTEST:		_				in compliance			
Pump Bailer	Air	Flowing Artesian		s. Material Ige and bel		nd information	- ; •		
Permeability	Yield	GPM		$\Lambda$	$\langle \Lambda \rangle$	0 1		WC Number	
Conductivity 672		<u> 28</u>		Han	X /	rowy	D	ate <u>10-</u>	445
Temperature of water 17.8  Was water analysis done?		esian flow found ft.		Monitor V	دم- ۱ اطا	tructor Certific	eation:		
	ies Krien	<b>:</b> ♣				the construction		or abandonn	nent
By whom?  Depth of strata to be analyzed.	From	ft. to ft.	work per	formed on	this well	during the con	struction dates	s reported ab	ove. All
			work per			time is in comp e to the best of			
ACHIAI KS;			- stantiards		υι 15 uu • Δ	to the pest of			
Name of supervising Geologist	/Fngineer	• • • • •	·/	TH.	1	(O)	M\ -	WC Number	11-85
		R RESOURCES DEPARTMEN	. Signed_ T SECON	COPY	ים דפות	JCTOR THII	PD COPY CT	STOMED	11-00
OMONAL &	. I MOI COI I-WAIE	A RESCUENCES DEL ARTHER	. SECONI	. COF 150	O'10 I'V	CIOR IIII	w cor 1-cu	JIVIER	•
						<del></del>			



ONITORING WELL REPORT equired by ORS 537.765 & OAR 690-240-095) tructions for completing this report are on the last page of	of this form	Sta	ırt Card #	W14	765	2	
OWNER/PROJECT: WELL NO. W.,	( 1)	(6) LOCATIO	ON OF W	ELI.Rv I	egal descri	otion	
eWar Ker Siltronic Cora	- + +	Well Location: C				F-4-4-1	
ress 2200, N.W Front Ave.		Township <u>J N</u>	(N or	S) Range	(E or		13
Portland State Or Zip	97210	1. <u>SW</u>	ے_ 1/4 of	5W 1	/4 of above sec	ction.	
TYPE OF WORK:		2. Either Street	address of v	vell location	1200 Ori	Nuc	
New construction Alteration (Repair/Recon	ndition)	or Tax lot number			00		
	andonment	3. ATTACH MA approximate sca			DENTIFIED.	Map shal	l include
DRILLING METHOD		(7) STATIC V					
☐ Rotary Air ☐ Rotary Mud ☐ Cal ☐ Hollow Stem Auger ☐ Other ☐ Cal	ole	27.4 Ft. Artesian Pressure			Date	0-2c	<u>-03</u>
BORE HOLE CONSTRUCTION		(8) WATER I	BEARING	G ZONES	:		
Yes No		Depth at which	water was f	irst found			
ial Standards 💢 📋 Depth of completed well_		From	To	Est.	Flow Rate		SWL
Vault (	Land surface	109	124	100	R	ECE	WE
	ter-tight cover						124
	rface flush vault				J	1106	2004
Lo Principal Control	cking cap	(9) WELL LC	)C•	6 11	\A/ATE(	B D E COL	12055
	sing iameter 2 in.	• •	JG:	Ground ele	vation <b>WATE</b> I S	ALEM, C	
7 6 6 MIN MIN 2 6 6 1	naterial P.U.C	Mater	rial		From	То	SW
1 1000000000000000000000000000000000000	lded Threaded Glued	Topsoi	/		0	1	<u> </u>
0087		Sapa	Light	Brown		30	<b>↓</b>
Seal DOS Lin		Siltwit	1 Zaye	NO5	30		<u> </u>
5 ft.   OSO dia	imeter hone in.	Sand	1 6			52	+
	iterial	Sand	doil+	with	52	187	+
10 < 02 602 1000	elded Threaded Glued	5 1446	musl		187	202	_
	ll seal:	Basal	1		203	200	
	aterial Bentonite Grou						
	nount 1950 163					1	
So Gr	out weight #10,0						
Bo	rehole diameter					7.3	
	9 in.			RE(	CEIVE	D +	
Company of the compan	ntonite plug at least 3 ft. thereen	nick					<del> </del>
Filter GR CI Harris GR CI m	aterial Stain 1855			DEC	1 0 200	3	1
Dack   SOOS H SOOS	erval(s):						
of Dog Fr	om 109 to 124			WATER H	ESOURCES M. OREGO	N	
79 く、							
	ot size <u>10</u> in.					 	<del> </del>
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	ter pack:		27	-7		10 2	1-03
	aterial Sand te 10-20 in.	Date started 9	-21-0	2	Completed _	10-21	-03
OC Size	te <u>10-2-0</u> in.	(unbonded) Moni	tor Well Cor	structor Cert	ification:		
WELL TEST:		<ul> <li>I certify that the second of th</li></ul>					
Pump Bailer Air	Flowing Artesian	abandonment of the standards. Materi	als wen is n	i compliance I information	reported abov	e are true to	o the bes
Permeability Yield /	GPM	knowledge and b		11/		WC Numbe	
Conductivity 576 USICN PH 643		Signed	None			Date	
Temperature of water 16.03 °F/C Depth artesian is	flow found ft.			4			
Was water analysis done? Yes No		(bonded) Monitor				or abande-	ment
By whom?		I accept respon work performed o					
Depth of strata to be analyzed. From ft. to	ft.	work performed d	uring this ti	me is in com	pliance with O	regon well	construc
Remarks:		standards. This re	port is true	to the best b		ge and belie WC Number Date 7 7	
		A 2			M.	w u Numbe	オレン

MONITORING WELL REPORT (as required by ORS 537.765 & OAR 690-240-095)	MULT 7 <b>MULT0721</b>	72126 <b>26</b> [.0±_	L67#	76 147655	
Instructions for completing this report are on the last page of this	form.		irt Card #	117600	
(1) OWNER/PROJECT: WELL NO.		(6) LOCATIO	ON OF WELI	LBy legal descript	ion
Name Was Ker		Well Location: (	County_h_	Fromah	_
Address 2200 N. W Front Ave		Township	(N or S) Ra	nge / W (E or W	) Section 13
City Portland State Or 70,92	210	1. 5 W	ا ی 1/4 of	1/4 of above secti	on.
(2) TYPE OF WORK: RECEIVED		2. Either Street	address of well lo	ocation <u> </u>	1.W Front
New construction Alteration (Repair/Recondition		or Tax lot number			
Conversion Deepening Abandon	1 1		PWITH LOCAT	TION IDENTIFIED. Now.	Map shall include
(3) DRILLING METHOD SALEM, OREGON		(7) STATIC V	VATER LEV	EL:	
Rotary Air Rotary Mud Cable				e. Date_ <u>/0</u>	-20-03
Hollow Stem Auger Other			e lb/		
BORE HOLE CONSTRUCTION	<u></u>	(8) WATER I	BEARING ZO	ONES:	
Yes No	1	Depth at which	water was first fo		
Special Standards 💢 🔲 Depth of completed well		From	То	Est. Flow Rate	SWL
Vault	_ Land surface	145	160	.75	27.9
		<u> </u>		<del></del>	
Surface fl					
$\frac{1}{2}$ ft. $\frac{9}{3}$ Locking of	•	(C) AVELLIA			
Casing	7)	(9) WELLLO	)G: Grou	und elevation	<del></del>
multiple diameter material		Mate		From	To SWL
		Mater	<i>1</i>	FIOII	7
to 125 South South Welded	Threaded Glued	100 501	1 D	0	72
	$\mathbf{X}$	Dana Z	ight bro	30	30
Seal Doo Liner	_	Sipt wir	the Layers		<del></del>
12.5 ft.   0.9 0.9	none in.	0700g			52
material		pand 19	lack wit	52	
70 / OOO Welded	Threaded Glued	Laxers	05,51T		182
		Silty G	ravel	187	203
140 ft. 8 8 9 Well seal:	Bentonite Crout	_ Waisali	<i>T</i>	203	207
	200 165				
© o° Grout we	ight <b>/0.0</b>		<del></del>		
Borehole		ļ	·····		
	in.				
	plug at least 3 ft. thick	` <del>  1. 1 / 1 </del>	. 12	C PILL	(1)
Filter Real Screen	as to lack	well w	as Baci	Tilled Hu	(T)
	Stalk 1255	8 600	Tell Del	tonie pellet	5
140t. Prom/4	5 To 160	From 16	1 76 20	<del>-   -   -   -   -   -   -   -   -   -  </del>	
<b></b> / (表)が名とは中部を記している		<del></del>			
TO SOUND From SOUND STORM					
	in.				
Filter pac	k: .5				01 03
Aterial	Sand 0-20 in.	Date started		Completed 10	-21-05
Coog Coog Size 10	in.	(unbonded) Moni	tor Well Construct	tor Certification:	
(5) WIN I THE				ed on the construction, a	
(5) WELLTEST:				pliance with Oregon we rmation reported above :	
Pump Bailer Air Flow	wing Artesian	knowledge and b		=	
Permeability Bailer Air Flow Permeability Yield Conductivity 45/ US/cm PH 6.6/	_OPINI				C Number
Conductivity 45 US/CM PH 6,6	_ c	Signed		Dat	te
Temperature of water 45.25 °FC Depth artesian flow fo		(bonded) Monitor	Well Constructor	Certification:	
Was water analysis done? Yes No		,		onstruction, alteration, or	abandonment
By whom?		work performed o	n this well during	the construction dates i	reported above. All
				in compliance with Ore e best of my knowledge	
Remarks:		stanuarus. Tiiis fe	port is true to the		
Name of superpicture Contractor Manager Manager	\$ A1				C Number
Name of supervising Geologist/Engineer <b>Man Faster</b> ORIGINAL & FIRST COPY-WATER RESOURCE	CES DEPARTMENT	SignedSECOND COPY-	CONSTRUCTOR	Dat R THIRD COPY-CUS	e TOMER



DEC 1 0 2003

WATER RESOURCES DEPT SALEM, OREGON

#### **MULT 72126**



#### Water Resources Department

Commerce Building 158 12th Street NE Salem, OR 97301-4172 503-378-3739 FAX 503-378-8130

 $V_{i,j}^{(i)}$ 

September 2, 2003

MARK KNOLLE #10437 C/O PROSONIC CORP 305 E. COMSTOCK DR CHANDLER AZ 85225

#### FINAL ORDER

Dear Mr. Knolle:

The special standard request you submitted for owner: Wacker Siltronic, start card numbers 147653-147655 is approved for the following: multiple completion wells, the wells will have two (2) 2 inch wells in each borehole. See Oregon Administrative Rule (OAR) 690-240-0410(5). Your special standard request form is enclosed.

The Well Construction Standards serve to protect ground water resources. By approving and issuing this special construction standard the Oregon Water Resources Department is not representing that a well constructed in accordance with this condition will maintain structural integrity or that it meets engineering standards. The well constructor/or landowner is responsible for ensuring that a well is constructed in a manner that protects ground water resources as required under Oregon Administrative Rules 690-200 through 690-240.

If you have any questions concerning this letter, I may be contacted at (503) 378-8455 ext 283, or by e-mail at tracy.l.eichenlaub@wrd.state.or.us.

Sincerely.

Ms. Tracy Eichenlaub

Well Construction Specialist

**Enforcement Section** 

enclosure

cc: Dorothy Pedersen, NW Region Monitor Well Inspector

This is a final order in other than a contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review of the order must be filed within the 60 day time period specified by ORS 183.484(2). Pursuant to ORS 536.075 and OAR 137.004-0080 and OAR 690-01-0005 you may either petition for judicial review or petition the Director for reconsideration of this order.

#### **MULT 72126**



Water Resources Department

Commerce Building 158 12th Street NE Salem, OR 97301-4172 503-378-3739 FAX 503-378-8130

October 6, 2003

MARK KNOLLE #10437 C/O PROSONIC CORP 305 E. COMSTOCK DR CHANDLER AZ 85225

#### **FINAL ORDER**

Dear Mr. Knolle:

The special standard request you submitted for owner: Wacker Siltronic, start card number 147655 is approved for the following: use of bentonite below 50 feet and through more than 25 feet of water, 3/8 inch bentonite pellets will be used to abandon the bottom of the hole from 206 feet to 160 feet. See Oregon Administrative Rule (OAR) 690-240-0475(3). Your special standard request form is enclosed.

The Well Construction Standards serve to protect ground water resources. By approving and issuing this special construction standard the Oregon Water Resources Department is not representing that a well constructed in accordance with this condition will maintain structural integrity or that it meets engineering standards. The well constructor/or landowner is responsible for ensuring that a well is constructed in a manner that protects ground water resources as required under Oregon Administrative Rules 690-200 through 690-240.

If you have any questions concerning this letter, I may be contacted at (503) 986-0851, or by e-mail at tracy.l.eichenlaub@wrd.state.or.us.

Sincerely,

As. Tracy Eichenlaub

Well Construction Specialist

**Enforcement Section** 

enclosure

cc: Dorothy Pedersen, NW Region Monitor Well Inspector

This is a final order in other than a contested case. This order is subject to judicial review under ORS 183.484.

Any petition for judicial review of the order must be filed within the 60 day time period specified by ORS 183.484(2). Pursuant to ORS 536.075 and OAR 137.004-0080 and OAR 690-01-0005 you may either petition for fluidial review of period the Director for reconsideration of this order.

OCT 0 9 2083

Maul Fos	ter &	Alongi, l	nc.	Project I <b>8128.</b>			Well Number WS-11	Sheet 1 <b>of 11</b>
Project Name Project Location Start/End Date Driller/Equipme Geologist/Eng	e ent ineer	7200 North 9/21/03 to Prosonic C Tony Silva	iwest I 10/3/0 Corpora	Corporation Front Avenue, Po	rporation  TOC Elevation (feet NGVD)  at Avenue, Portland Oregon 97210  Surface Elevation (feet NGVD)  Northing  Easting  Hole Depth			GVD) 31.8500 31.9350 7624628. 705147.0 207.0-fee
Sample Metho	a Vell	4x6 Core E		ample Data		T	Outer Hole Diam Soil Description	9.0/6.0-in
7.2	etails	Interval Percent Recovery	Collection Method	in pie Data in Name (Type) Name (Type)	Blows/6"	Lithologic Column	Sui Descriptori	
1	8	100%	СВ	PID = 0.0			0.0 to 0.5 feet: TOPSOIL, GRAVELLY SII non plastic; 30% gravel, medium, subarotets, woody debris; moist. 0.5 to 1.5 feet: SANDY GRAVEL (GP); brandlium; 60% gravel, fine, subangular 1.5 to 7.0 feet: SAND (SP); light brown; 98 to medium, subrounded; moist. (Fill)	angular, 50% organic debris, rownish-gray; 40% sand, fine to to subrounded; dry. (Fill)
2 3 4 5	\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- 100%	СВ	PID = 0.0			o median, edicional deci, mose (i ii)	
6	150 80 80 80 80 80 80 80 80 80 80 80 80 80			PID = 0.0				
7 8 9		<sup>-</sup> 100%	СВ	PID = 0.0			7.0 to 12.0 feet: SAND (SP); dark brown; fines and gravels; moist. (Fill)	100% sand, fine to medium; trace
10				PID = 0.0				
13				PID = 0.0			12.0 to 16.0 feet: WOOD; core of wood; s naphthalene or petroleum like odor. (f	
15		- 4000	65	PID = 0.0			160 b 170 for CAND (OD) 1-11	4000 and for to
17		100%	СВ				16.0 to 17.0 feet: SAND (SP); dark brown, fines and gravels; moist. Possibly dri the hole from the wood. (Fill)  17.0 to 18.0 feet: WOOD; core of wood; s naphthalene or petroleum like odor. (Fill)	ling sluff from trying to clean out taining at upper end of wood;
19		100%	СВ	PID = 0.0			18.0 to 19.0 feet: SAND (SP); light brown, trace fines and gravels; moist. (Fill)	
20				PID = 0.0			19.0 to 21.0 feet: SANDY SILT (ML-SM); 50% sand, fine to medium; dry. Brittle	
NOTES: 1. CE	R=4x6-ino	h core harrel soil sa	mnler 2	PID — Photo ionization d	otootor	snil head snace i	eading in parts per million. 3. GW=groundwater samp	nle, dashed graphic indicates approximate.

21   Well Details   22   33   34   34   34   34   34   34	Spiral Interval	Percent Recovery	Collection Method &	PID = 0.0  PID = 0.0  PID = 0.0  PID = 0.0  PID = 0.0	BB		Soil Description  21.0 to 27.0 feet: SAND (SP); reddish-brown; 90% sand, gravel, fine to medium, subrounded; dry to moist. (Fill)  @ 22.5 feet: 0.2-foot layer color change to light gray. St steel shackle from a padlock.  27.0 to 28.0 feet: NO RECOVERY.  28.0 to 31.5 feet: SAND (SP); dark gray; 95% sand, fine to gravels, subrounded; wet. (Fill)	iteel debris, possib
21 22 23 24 25 26 27 28 29 30 31 32 33 34 34 34 34 34 34 34	₩ Interva		Collectio	PID = 0.0  PID = 0.0  PID = 0.0  PID = 0.0			gravel, fine to medium, subrounded; dry to moist. (Fill @ 22.5 feet: 0.2-foot layer color change to light gray. St steel shackle from a padlock.  27.0 to 28.0 feet: NO RECOVERY.  28.0 to 31.5 feet: SAND (SP); dark gray; 95% sand, fine to	iteel debris, possib
29 30 31 31 32 33 34 34 34 34 35 36 37 37 37 37 37 37 37 37 37 37 37 37 37	$ar{arphi}$	90%	СВ	PID = 0.0 $PID = 0.0$ $PID = 0.0$			gravel, fine to medium, subrounded; dry to moist. (Fill @ 22.5 feet: 0.2-foot layer color change to light gray. St steel shackle from a padlock.  27.0 to 28.0 feet: NO RECOVERY.  28.0 to 31.5 feet: SAND (SP); dark gray; 95% sand, fine to	iteel debris, possib
29 30 31 31 32 33 34 34 34 34 35 36 37 37 37 37 37 37 37 37 37 37 37 37 37		- 90%	СВ	PID = 0.0			steel shackle from a padlock.  27.0 to 28.0 feet: NO RECOVERY.  28.0 to 31.5 feet: SAND (SP); dark gray; 95% sand, fine to	
29 30 31 32 33 34	Ţ Ţ	<b>-</b> 90%	СВ	PID = 0.0	,		28.0 to 31.5 feet: SAND (SP); dark gray; 95% sand, fine t	to medium; 5%
29 30 31 31 32 33 34 34	<u></u>	90%	СВ				28.0 to 31.5 feet: SAND (SP); dark gray; 95% sand, fine t	to medium; 5%
29 30 31 32 33 34	<u></u>	90%	СВ				28.0 to 31.5 feet: SAND (SP); dark gray; 95% sand, fine t	to medium; 5%
29 30 31 32 33 34	<b>▽</b>			PID = 0.0			28.0 to 31.5 feet: SAND (SP); dark gray; 95% sand, fine t gravels, subrounded; wet. (Fill)	to medium; 5%
30 31 32 33 34				PID = 0.0				
32 33 34						5000000000		
34	▓ ■						31.5 to 37.0 feet: SILTY SAND to SANDY SILT (SM-ML),	); dark gray; 50%
34				PID = 13.6			fines, non plastic; 50% sand, fine; organic debris, roc @ 31.5 feet: 0.2-foot thick layer of staining, sheen. Petro	
<sup>35</sup> 🔀 🛱 🛭								
36				PID = 0.0				
37		90%	СВ	PID = 0.0	,	<u> </u>	37.0 to 38.0 feet: NO RECOVERY.	
39							38.0 to 41.0 feet: SANDY SILT (ML); dark gray; 60% fine sand, fine; organic debris, wood, roots; wet.	es, non plastic; 40
40				PID = 0.0	,			
41 22							41.0 to 47.0 feet: SILTY SAND (SM); dark gray; 25% fine sand, fine to medium; organic debris, roots, woody depetroleum-like odor.	es, non plastic; 75 lebris; wet. Faint

Ма	ul Foster & A	Along	i, In	ıc.	-	t Numbe	er	Borehole Log/Well Con  Well Number	Sheet
	Well	1			812 ample Data	3.01.06	5	WS-11 Soil Description	3 of 11
Depth (feet, BGS)	Details	Interval	Recovery	Collection Method	an ipe Daia je un Name (Type	Blows/6"	Lithologic Column	Sui Descripio	л
<i>4</i> 3									
44									
<i>4</i> 5					PID = 0.0	,			
<i>4</i> 6									
47									
		_ 10	00%	СВ	PID = 0.0	9		47.0 to 50.0 feet: SILTY SAND (SM); a sand, fine to medium; micaceous; o	
<i>4</i> 8									
<b>4</b> 9									
50									
-1					PID = 0.0	7		50.0 to 53.5 feet: SAND with SILT (SP- plastic; 85% sand, fine to medium; r	
51									
52					PID = 0.0	,			
53									
ΕΛ					PID = 0.0	0		53.5 to 54.0 feet: SILT (ML); dark gray;	95% fines. low to medium plasticity
54								<u> </u>	<u>aceous; organic debris.</u> SM); dark gray; 15% fines, non
55								plastic; 85% sand, fine to medium; r	micaceous; wet.
<i>5</i> 6									
57									
<i>5</i> 8		10	00%	СВ	PID = 0.0			57.0 to 58.0 feet: SILTY SAND (SM); d sand, fine to medium; micaceous; o	
w								58.0 to 59.0 feet: SILT (ML); dark gray; fine sand in pockets; micaceous; or	
59					PID = 0.0	7		59.0 to 60.0 feet: SAND with SILT (SP-	
60					8/2			plastic; 85% sand, fine to medium; r	
61					PID = 0.0			60.0 to 64.0 feet: SILTY SAND (SM); d sand, fine to medium, micaceous; o	
62		10	00%	СВ	PID = 0.0	,			
63									
64					PID = 0.0				
								64.0 to 67.0 feet: SAND (SP); dark gray fine to medium; micaceous, coarse i	
65							Received	<u> </u>	·
NOT					. PID=Photo ionization urface. 5. PVC=poly			eading in parts per million. 3. GW=groundwater sa	mpie, dasned graphic indicates approximate
$\nabla$	Approximate wa			serve	d				

Sumple Date   Sumple Date Date   Sumple Date   Sumple Date Date   Sumple Date   Sumple Date   Sumple Date Date Date   Sumple Date Date   Sumple Date Date Date Date Date   Sumple Date Date Date Date Date Date Date Dat	Maul Foster 8	& Alonai. Ir	1C.	Project N			Borehole Log/Well Co	Sheet
### PID = 0.0    PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   PID = 0.0   P				8128.0			WS-11	4 of 11
66 67 68 69 69 69 60 60 60 60 61 60 60 61 60 61 60 61 60 61 60 61 61 62 63 64 65 65 65 67 67 67 67 68 68 69 69 69 60 60 60 60 60 60 60 60 60 60 60 60 60	Details  Well  Leet, BGS)	Interval Percent Recovery	Collection Method		Blows/6"	Lithologic Column	Soil Descri	iption
60 60 60 60 60 60 60 60 60 60 60 60 60 6				PID = 0.0				
### FID = 0.0    Fine; micaceous; organic debris, roots; moist to wet.	67	<b>-</b> 100%	СВ	PID = 0.0		2002000 2002000		
Fig. 2.0	68			PID = 0.0			fine; micaceous; organic debris,	gray; 5% ilnes, non piastic; 95% sand, roots; moist to wet.
PID = 0.0								
72.0 to 75.0 feet: NO RECOVERY, stuff.  75.0 to 78.0 feet: SILTY SAND [SM]; dark gray, 20% fines, non plastic; 8t sand, fine to medium; micaceous; wet.  76.0 to 78.0 feet: SAND (SP); dark gray, 5% fines, non plastic; 95% sand, fine; micaceous; wet.  77.0 to 78.0 feet: SAND (SP); dark gray, 5% fines, non plastic; 95% sand, fine; micaceous; wet.  80.0 PID = 0.0  81.0 to 82.0 feet: SILTY [ML]; dark gray, 95% fines, non plastic; 95% sand, fine; micaceous; organic debris, wet.  82.0 to 83.0 feet: SILTY SAND [SM]; dark gray, 5% fines, non plastic; 95% sand, fine to medium; micaceous; organic debris, wet.  83.0 to 84.0 feet: SAND (SP); dark gray, 5% fines, non plastic; 95% sand, fine to medium; micaceous; wet.  84.0 to 85.5 feet: SILTY SAND [SM]; dark gray, 20% fines, non plastic; 85% sand, fine to medium; micaceous; wet.	71		GW		)		@ 70.0 feet: 0.2-foot layer of silt with	h organic debris.
75 750 to 78.0 feet: SILTY SANID (SIM); dark gray, 20% fines, non plastic; 8t sand, fine to medium; micaceous; wet.  PID = 0.0  Region of the sand in poolets; micaceous; organic debris, roots; most.  Region of the sand in poolets; micaceous; organic debris, roots; most.  Region of the sand in poolets; micaceous; organic debris, roots; most.  Region of the sand in poolets; micaceous; organic debris, wet.  Region of the sand in poolets; micaceous; organic debris, wet.  Region of the sand in poolets; micaceous; organic debris, wet.  Region of the sand in poolets; micaceous; met.	72	80%	СВ	PID = 0.0			72.0 to 75.0 feet: NO RECOVERY;	sluff.
75.0 to 78.0 feet: SILTY SAND (SM); dark gray, 20% fines, non plastic; 8t sand, fine to medium; micaceous; wet.  78.0 to 82.0 feet: SAND (SP); dark gray, 5% fines, non plastic; 95% sand, fine; micaceous; wet.  79.0 to 82.0 feet: SAND (SP); dark gray, 5% fines, non plastic; 95% sand, fine, micaceous; wet.  82.0 to 83.0 feet: SILTY (ML); dark gray, 35% fines, non plastic; 5% sand, fine, micaceous; organic debris, roots; most.  83.0 to 84.0 feet: SILTY SAND (SP); dark gray, 20% fines, non plastic; 95% sand, fine, micaceous; organic debris, roots; most.  84.0 to 85.5 feet: SILTY SAND (SP); dark gray, 20% fines, non plastic; 95% sand, fine, micaceous; organic debris, roots; most.  85.0 to 85.0 feet: SILTY SAND (SIN); dark gray, 20% fines, non plastic; 95% sand, fine in medium; micaceous; wet.	73							
PID = 0.0	74							
PID = 0.0  78.0 to 82.0 feet SAND (SP); dark gray, 5% fines, non plastic; 95% sand, fine; micaceous; wet.  PID = 0.0  82.0 to 83.0 feet SILT (ML); dark gray, 95% fines, non plastic; 5% sand, fine, sand in pockets; micaceous; organic debris, roots; moist.  83.0 to 84.0 feet SAND (SP); dark gray, 5% fines, non plastic; 5% sand, fine; micaceous; organic debris, roots; moist.  84.0 to 85.5 feet SILTY SAND (SM); dark gray, 20% fines, non plastic; 8s sand, fine to medium; micaceous; wet.  85.5 to 86.0 feet SILT (ML); dark gray, 85% fines, non plastic; 15% sand fine, sand in pockets; micaceous; moist.  86.0 to 87.0 feet SAND (SP); dark gray, 5% fines, non plastic; 95% sand, fine, 5% organic debris, woody debris; micaceous; wet.								
PID = 0.0	77							
PID = 0.0  PID = 0.0  PID = 0.0  Relation to the problem of the pr				PID = 0.0				gray; 5% fines, non plastic; 95% sand,
PID = 0.0    SZ.0 to 83.0 feet: S/LT (ML); dark gray; 95% fines, non plastic; 5% sand, fine, sand in pockets; micaceous; organic debris, roots; moist.    83.0 to 84.0 feet: S/AND (SP); dark gray; 5% fines, non plastic; 95% sand, fine; micaceous; organic debris; wet.    84.0 to 85.5 feet: S/LTY S/AND (SM); dark gray; 20% fines, non plastic; 8t sand, fine to medium; micaceous; wet.    85.5 to 86.0 feet: S/LT (ML); dark gray; 85% fines, non plastic; 15% sand fine, sand in pockets; micaceous; moist.   86.0 to 87.0 feet: S/AND (SP); dark gray; 5% fines, non plastic; 90% sand, fine; 5% organic debris, woody debris; micaceous; wet.	80			PID = 0.0				
PID = 0.0    Record of the standard of the sta	81							
83.0 to 84.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine; micaceous; organic debris; wet.  84.0 to 85.5 feet: SILTY SAND (SM); dark gray; 20% fines, non plastic; 80 sand, fine to medium; micaceous; wet.  85.5 to 86.0 feet: SILT (ML); dark gray; 85% fines, non plastic; 15% sand fine, sand in pockets; micaceous; moist.  86.0 to 87.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 90% sand, fine; 5% organic debris; woody debris; micaceous; wet.				PID = 0.0				
B5.5 feet: SILTY SAND (SM); dark gray; 20% fines, non plastic; 80 sand, fine to medium; micaceous; wet.  85.5 to 86.0 feet: SILT (ML); dark gray; 85% fines, non plastic; 15% sand fine, sand in pockets; micaceous; moist.  86.0 to 87.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 90% sand, fine; 5% organic debris; woody debris; micaceous; wet.						HHHH		
GW WS11-W-87.0 PID = 0.0  85.5 to 86.0 feet: SILT (ML); dark gray; 85% fines, non plastic; 15% sand in pockets; micaceous; moist. 86.0 to 87.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 90% sand, fine; 5% organic debris; micaceous; wet.								
87 Inne, sand in pockets; micaceous; moist.  86.0 to 87.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 90% sand, fine; 5% organic debris; wicaceous; wet.			GW	WS11-W-87.0 PID = 0.0	)			
						H.H.H.	86.0 to 87.0 feet: SAND (SP); dark of	gray; 5% fines, non plastic; 90% sand,
		<del>-</del> 100%	СВ	PID = 0.0		44,44		

Ман	I Foster & /	Alongi Ir	36	Project N			Borehole Log/Well Con Well Number	Istruction Sheet
IVIAU	ii i Ostei & /	-iorigi, ii	ic.	8128.0			WS-11	5 of 11
Depth (feet, BGS)	Well Details	Interval Percent Recovery	Collection Method &	ample Data agum Name (Type)	Blows/6"	Lithologic Column	Soil Descripti	ion
88 88		2 00	0.5	PID = 0.0	В	70	\ <u>fine; micaceous; wet.</u> \87.5 to 88.0 feet: SILT with SAND (ML	); dark gray; 70% fines, non plastic;
89				7.2 = 0.0			\ <u>30% sand, fine to medium; micacec</u> 88.0 to 92.5 feet: SAND (SP); dark gra fine; micaceous; wet.	<u>ous: organic debris: moist to wet.</u> y; 5% fines, non plastic; 95% sand,
90 91				PID = 0.0				
91 92								
93							92.5 to 94.5 feet: SILT (ML); dark gray, sand, fine to medium, sand in pock	: 90% fines, medium plasticity; 10% ets; micaceous; organic debris; wet.
94							94.5 to 98.0 feet: SAND (SP); dark gra	v. 5% fines, non plastic: 95% sand
95 96				PID = 1.5			fine; micaceous; wet.	,,
97				PID = 1.5				
98 99							98.0 to 102.0 feet: SAND with SILT (SI plastic; 85% sand, fine to medium; nodules, up to 0.5-inches in diamete	micaceous; wet. Fines occur in
100 101			GW	WS11-W-102. PID = 4.5	0			
102 103	\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$	100%	СВ	PID = 13.6			102.0 to 107.0 feet: SAND (SP); dark g fine to medium, red and green lithic	
104	## ## ## ## ## ## ## ## ## ## ## ## ##			PID = 0.0				
105				PID = 0.0			@ 105.0 feet: 0.2-foot layer of SILT (M fine, sand in pockets; wet. @ 105.5 feet: 0.2-foot layer of SILT (M	
107		- 90%	СВ	PID = 0.0			fine, sand in pockets; wet.  107.0 to 108.0 feet: NO RECOVERY.	
108				PID = 3.0			108.0 to 112.0 feet: SILT (ML); dark gr to medium plasticity; micaceous; or	
109 110							Visible sheen on water in soil core bag.	
NOTE				PID = Photo ionization de urface. 5. PVC = poly viny			reading in parts per million. 3. GW=groundwatersa	ample, dashed graphic indicates approximate
	Approximate wa prior to well dev		serve	d				

Well   Description   Sompto Date   Sompto Date   Sompto Date   Soft Description   Soft	Maı	ıl Fostar & A	Monai II	nc	Project N			Borehole Log/Well Con	struction Sheet
PID = 0.0   PID = 3.1		_	yı, II		8128.0			WS-11	6 of 11
112 D to 1160 feet: SAND   SPI; dark gay; 5% fines, non pleate; 95% sen fine to medium, red and green lithics; micacous; well.	Depth (feet, BGS)		Interval Percent Recovery	Collection Method		Blows/6"	Lithologic Column	Soil Descriptio	n
165   GW   WS11-W-1170   WS11-W-DP   PID = 3.1   PID = 6.2   TIBO to TIBO feet: SLT Y SAND (SM); dark gray, 20% lines, non please; 80% sand, fine to medium wet. Pid to the standard wet. PID = 0.0   TIBO to TIBO feet: SLT (ML), dark gray, 50% lines, non please; 95% sand fine to medium, red and green lithics, micacocus; wet.   PID = 0.0   TIBO to TIBO fied: SLT (ML), dark gray, 50% lines, non please; 95% sand fine to medium, red and green lithics, micacocus; wet.   PID = 0.0   TIBO to TIBO fied: SLT Y SAND (SM); dark gray, 20% lines, non please; 95% sand fine to medium, red and green lithics, micacocus; wet.   TIBO to TIBO fied: SLT Y SAND (SM); dark gray, 20% lines, non please; 95% sand fine to medium, red and green lithics, micacocus; wet.   TIBO to TIBO fied: SLT Y SAND (SM); dark gray, 20% lines, non please; 95% sand fine to medium, red and green lithics, micacocus; wet.   TIBO to TIBO fied: SLT Y SAND (SM); dark gray, 20% lines, non please; 95% sand fine to medium, red and green lithics, micacocus; wet.   TIBO to TIBO fied: SLT Y SAND (SM); dark gray, 20% lines, non please; 95% sand fine to medium, red and green lithics; micacocus; wet.   TIBO to TIBO fied: SLT Y SAND (SM); dark gray, 20% lines, non please; 95% sand fine to medium, red and green lithics; micacocus; wet.   TIBO to TIBO fied: SLT Y SAND (SM); dark gray, 20% lines, non please; 95% sand fine to medium, red and green lithics; micacocus; wet.   TIBO to TIBO fied: SLT Y SAND (SM); dark gray, 20% lines, non please; 95% sand fine to medium, red and green lithics; micacocus; wet.   TIBO to TIBO fied: SAND (SM); dark gray, vithin white speckles; sait and   TIBO to TIBO fied: SAND (SM); dark gray with white speckles; sait and   TIBO to TIBO fied: SAND (SM); dark gray with white speckles; sait and   TIBO to TIBO fied: SAND (SM); dark gray with white speckles; sait and   TIBO to TIBO fied: SAND (SM); dark gray with white speckles; sait	111 112 113								
119	114 115 116			GW	WS11-W-DUF			@ 116.0 feet 0.1-foot layer of SILT (ML	<i>)</i> .
80% sand, fine to medium, wet. Faint odor.  PID = 0.0	117 118		100%	СВ	PID = 3.1				
PID = 0.0    fine to medium, red and green lithics; micaceous, wet.   122   122   123   124   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   125   12	119 120				PID = 6.2			80% sand, fine to medium; wet. \(\strong odor, visible sheen on soil. \) 118.5 to 119.5 feet: \(\silt) IT (ML); dark graphs and the sheet of	y; 95% fines, low to medium wet. Faint odor.
plasticity; 5% sand, fine to medium; micaceous; wet.    PID = 0.0	121 122				PID = 0.0			119.7 to 120.0 feet: SILT (ML); dark gra plasticity: 5% sand_fine to medium;_ 120.0 to 122.0 feet: SAND (SP); dark gra fine to medium, red and green lithics	y; 95% fines, low to medium <u>micaceous: wet.</u> ay; 5% fines, non plastic; 95% sar ; micaceous; wet.
PID = 0.0	123 124				PID = 0.0			plasticity; 5% sand, fine to medium;  123.0 to 127.0 feet: SAND (SP); dark gi	micaceous; wet. ay; 5% fines, non plastic; 95% sar
PID = 0.0  PID = 0.0  127.0 to 128.0 feet: SILTY SANID (SIM); dark gray; 20% fines, non plastic; 80% sand, fine to medium, red and green lithics; wet.  128.0 to 132.0 feet: SANID (SP); dark gray; 5% fines, non plastic; 95% sar fine to medium, red and green lithics; micaceous; wet.  130  GW WS11-W-132.0  PID = 0.0  PID = 0.0  132.0 to 137.0 feet: SANID (SP); dark gray; organic debris.  131  132  NOTES: 1. CB=4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW=groundwater sample, dashed graphic indicates approximate	125 126				PID = 0.0				
fine to medium, red and green lithics; micaceous; wet.  GW WS11-W-132.0 PID = 0.0  132.0 to 137.0 feet: SAND (SP); dark gray with white speckles, salt and  NOTES: 1. CB=4x6-inch core barrel soil sampler. 2. PID=Photo ionization detector, soil head space reading in parts per million. 3. GW=groundwater sample, dashed graphic indicates approximate	127 128		<del>-</del> 100%	СВ	PID = 0.0			80% sand, fine to medium, red and	green lithics; wet.
GW WS11-W-132 0	129								
VOTES: 1. CB=4x6-inch core barrel soil sampler. 2. PID=Photo ionization detector, soil head space reading in parts per million. 3. GW=groundwater sample, dashed graphic indicates approximate	130 131			GW		o		@ 130.0 feet: 0.3-foot layer of SILT (ML	.); dark gray; organic debris.
	132		100%	СВ	PID = 0.0				ray with white speckles, salt and
	NOTE							eading in parts per million. 3. GW=groundwater sar	nple, dashed graphic indicates approximate

133 (seet, BGS) 134 135	Well Details	val ent ivery	<sub>s</sub> Se	8128.0			WS-11	/ 01 11
133	Details	Interval Second					Soil Descripti	7 <b>of 11</b>
134		Inter Perca Reco	Collection Method	Name (Type)	Blows/6"	Lithologic Column		
135				PID = 0.0			pepper look; 5% fines, non plas wet.	stic; 95% sand, medium; micaceous,
136				PID = 0.0				
136								
138		- <sub>70%</sub>	СВ	PID = 0.0		277.72	137.0 to 140.0 feet: NO RECOVERY.	
139	<b>⋙</b> ₩							
140 🗗	**************************************			PID = 0.0			140.0 to 146.5 feet: SAND (SP); dark	gray with white speckles, salt and 95% sand, medium, dark green and
141							pepper look; 5% tines, non plastic; s red lithics; micaceous; wet.	5070 Sanu, meulum, uark green and
142								
144				PID = 0.0				
145		Ξ	GW	WS11-W-147.	n			
146			GW	PID = 0.0	U			
147		100%	СВ	PID = 0.0			146.5 to 147.0 feet: SILT (ML); dark gr plasticity: 5% sand, fine to medium 147.0 to 150.0 feet: SAND (SP); dark g	i <u>, sand in pockets; micaceous; wet.</u> gray; 5% fines, non plastic; 95% sar
148				PID = 0.0			medium, dark green and red lithics;	micaceous; wet.
149   150								
151				PID = 0.0			150.0 to 152.0 feet: SILT with SAND (i medium plasticity; 30% sand, fine to organic debris; wet.	ML); dark gray; 70% fines, low to o medium, sand in pockets; micaced
152							150 0 to 150 0 foot CAND (CD), ded.	new 50/ finos non platia 050/
153				PID = 0.0			152.0 to 153.0 feet: SAND (SP); dark green and red lithics; 153.0 to 153.5 feet: SILT with SAND (i	micaceous; wet.
154							medium plasticity; 30% sand, fine to organic debris; wet 153.5 to 157 feet: SAND with SILT (SF	o medium, sand in pockets; micaceo P-SM); dark gray; 15% fines, non
155							plastic; 85% sand, fine to medium, wet. Fines occur in chunks or ball	red and green lithics; organic debri ls.

							Borehole Log/Well Cor	
Ma	ul Foster & A	Alongi,	inc.	-	t Numbe <b>3.01.06</b>		Well Number WS-11	Sheet 8 of 11
Depth (feet, BGS)	Well Details	Interval Percent Recovery	Collection Method	Sample Data    ja	Blows/6"	Lithologic Column	Soil Descript	ion
156				PID = 0.0				
_ 150 _ 157		- <sub>100</sub>	% СВ	PID = 0.0			√ <u>@ 157.0 feet</u> <u>0.2-foot layer of SILT (N</u> 157.2 to 160.0 feet: SAND (SP); dark	1L).
_ 158							pepper look; 5% fines, non plastic; s lithics; wet.	gray with write specties, sait and 95% sand, medium, green and red
_ 159 _ 160								
_ 161	00000000			PID = 0.0	0		160.0 to 161.0 feet: SILT with SAND ( medium plasticity; 30% sand, fine to 161.0 to 164.0 feet: SAND (SP); dark	o medium; wet.
_ 162	00000000 000000000 00000000 00000000 0000						pepper look; 5% fines, non plastic; lithics; wet.  @162.0 feet: 0.3-foot layer of SILT (M.	95% sand, medium, green and red
163				PID = 0.0	,	innin	@162.8 feet: 0.3-foot layer of SILT (M.	L).
_ 164 165	010101010 010101010 010101010 010101010						164.0 to 165.0 feet: SILT (ML); dark g medium plasticity; 10% sand, fine,	ray to greenish-gray; 90% fines, low sand in pockets; organic debris; wet.
- _ <i>16</i> 6	######################################		GW	WS11-W-16 PID = 0.0			165.0 to 165.5 feet: SANDY SILT (ML, fines, non plastic; 40% sand, fine; 165.5 to 167.0 feet: SAND (SP); dark pepper look; 5% fines, non plastic; s lithics; wet.	wetgray with white speckles, salt and
_ 167 . 168	00000000000000000000000000000000000000	80%	6 СВ	PID = 0.0	,		167.0 to 169.0 feet: NO RECOVERY.	
_ 169	00000000000000000000000000000000000000							
_ 170	00000000 00000000 0000000 0000000 000000			PID = 0.0	,		169.0 to 170.5 feet: SAND (SP); dark pepper look; 5% fines, non plastic; wet.	gray with white speckles, salt and 95% sand, fine, green and red lithic
_ 171 . 172	00000000000000000000000000000000000000						170.5 to 171 feet: SILTY SAND (SM); <u>80% sand, fine; wet</u> 171.0 to 174.0 feet: SAND (SP); dark of fine to medium, dark green and red	gray; 5% fines, non plastic; 95% sand
173				PID = 0.0				
174	000000000 00000000 00000000 00000000 0000						174.0 to 174.5 feet: SILT (ML); dark gi medium plasticity: 10% sand, fine.	sand in pockets; wet.
_175 _176	00000000 00000000 00000000 00000000 0000			PID = 0.0			174.5 to 179.0 feet: SAND (SP); dark pepper look; 5% fines, non plastic; red lithics; wet.	gray with white speckles, salt and 95% sand, fine to medium, green an
177	000000000 00000000 00000000 00000000 0000	- <sub>100</sub>	% СВ	PID = 0.0				
NOT				2. PID=Photo ionization	detector, s		reading in parts per million. 3. GW=groundwaters	ample, dashed graphic indicates approximate
		· ·		surface. 5. PVC=poly v	inyl chlorid	de.		
$\nabla$	Approximate wa prior to well deve			ea				

Иa	ul Foster & /	Alonai.	Inc.		Project I			Borehole Log/Well Co	Sheet
	1				8128.			WS-11	9 of 11
(feet, BGS)	Well Details	Interval Percent	Collection Method	Sample L Vanny	Data Name (Type)	Blows/6"	Lithologic Column	Soil Descri	otion
 78 79	00000000 00000000 0000000 00000000 00000				PID = 0.0				
80			GW		VS11-W-182	o		179.0 to 182.0 feet: SAND (SP); dar pepper look; 100% sand, medium	
31	\$\inf\tau\tau\tau\tau\tau\tau\tau\tau\tau\tau				PID = 0.0				
32 33	00000000000000000000000000000000000000	100	% СВ		PID = 0.0			182.0 to 187.0 feet: SAND (SP); dan fine, red lithics; wet.	k gray; 5% fines, non plastic; 95% s
34	00000000000000000000000000000000000000				PID = 0.0				
35 36	\$\int \$\int \text{\$\int				PID = 0.0				
37		909	% СВ		PID = 0.0				
38 39 90					PID = 0.0			188.0 to 195.0 feet: SAND (SP); dan fine, red lithics; wet.	k gray; 5% fines, non plastic; 95% s
91 92	616961616 1616961616 1616961616 1616961616 1616961616 1616961616 1616961616 1616961616								
93 94	0,00,00,00,00,00,00,00,00,00,00,00,00,0				PID = 0.0				
95 96	65656566 101010101 101010101 1010101010 10101010		GW	и	VS11-W-197 PID = 0.0	О		195.0 to 195.5 feet: SILT (ML); dark plasticity; 5% sand, fine, sand in wet.	gray to greenish-gray; 95% fines, lo pockets; organic debris, roots, lea
97	[10[10]10[10]   10[10]10[10]   10[10]10[10]   10[10]10[10]   10[10]10[10]   10[10]10[10]   10[10]10[10]	######################################	% СВ		PID = 0.0			195.5 to 201.0 feet: SAND (SP); dan fine to medium, red lithics; wet.	k gray; 5% fines, non plastic; 95% s
98 m	010101010 010101010 010101010 010101010				2 = 0.0				
99 10									
ОТ	ES: 1. CB=4x6-inch screened interval.	core barrel soi	l sampler. 2 ow ground :	2. PID=F surface. 5	Photo ionization de 5. PVC = polv vin	etector, :	soil head space r	eading in parts per million. 3. GW=groundwate	r sample, dashed graphic indicates approxima

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						G	eologic	Borehole Log/Well Con	struction
Mai	ul Foster & A	Jongi, I	nc.		Project l	Vumbe	r	Well Number	Sheet
					8128.0	01.06		WS-11	10 of 11
(S)	Well		<sub>2</sub> S	ample Da	ta			Soil Description	on
Depth (feet, BGS)	Details	Interval Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column		
202		рининининин	GW	,	PID = 0.0 PID = 0.0			201.0 to 204.5 feet: SILTY GRAVEL (G 85% gravel, fine to coarse, subroun 204.5 to 207.0 feet: BASALT; light gray (Columbia River Basalt Group) Sign hardness.	to dark gray; moist to wet; bedrock.  nificant increase in resistance, drilling

Total Depth = 207.0 feet below ground surface.

#### WS11 Completion Details

Oregon Water Resources Department Well Start Card Number: W147655 Oregon Water Resources Department Well Identification Number: L67076

#### Boring:

0.0 to 58.0 feet bgs: 9-inch temporary, threaded steel, isolation casing. 0.0 to 137.0 feet bgs: 8-inch temporary, threaded steel, isolation casing. 0.0 to 58.0 feet bgs: 7-inch temporary, threaded steel, isolation casing. 0.0 to 207.0 feet bgs: 6-inch temporary, threaded steel, isolation casing. 0.0 to 207.0 feet bgs: 4x6-inch core barrel sampler.

0.0 to 1.5 feet bgs: flush mount vault and cement seal.

1.5 to 5.0 feet bgs: 3/8-inch Baroid bentonite chips hydrated with potable water.

5.0 to 102.0 feet bgs: bentonite grout slurry, 10.0 pounds per gallon.
102.0 to 104.0 feet bgs: non-acetone coated, 3/8-inch bentonite chips hydrated with potable water.

104.0 to 106.0 feet bgs: 20x40 washed Colorado silica sand, secondary filter pack.

106.0 to 124.0 feet bgs: 10x20 washed Colorado silica sand, primary filter pack.

124.0 to 126.0 feet bgs: non-acetone coated, 3/8-inch bentonite chips hydrated with potable water.

126.0 to 139.0 feet bgs: bentonite grout slurry, 10.3 pounds per gallon. 139.0 to 140.0 feet bgs: non-acetone coated, 3/8-inch bentonite chips

139.0 to 140.0 feet bgs. Norracetorie coateu, 3/o-inch bentonite chips hydrated with potable water. 140.0 to 142.0 feet hos: 20x40 washed Colorado silica sand, secondary t

140.0 to 142.0 feet bgs: 20x40 washed Colorado silica sand, secondary filter pack.

142.0 to 161.0 feet bgs: 10x20 washed Colorado silica sand, primary filter pack.

161.0 to 207.0 feet bgs: non-acetone coated, 3/8-inch bentonite chips hydrated with potable water.

#### Well WS11-125:

0.0 to 109.0 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe.
109.0 to 124.0 feet bgs: 2-inch diameter, stainless steel wire wrapped screen, 0.010-slot.

124.0 to 125.0 feet bgs: 2-inch diameter, stainless steel sump.

				G	eologic	Borehole Log/Well Cons	struction
Mau	ıl Foster & A	longi, Inc.	Project	Numbe	r	Well Number	Sheet
			8128	.01.06		WS-11	11 of 11
Depth (feet, BGS)	Well Details	Interval Percent Recovery Collection Method	Sample Data    ja       Name (Type)	Blows/6"	Lithologic Column	Soil Description	1

Well WS11-161:
0.0 to 145.0 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe.
145.0 to 160.0 feet bgs: 2-inch diameter, stainless steel wire wrapped screen, 0.010-slot.
160.0 to 161.0 feet bgs: 2-inch diameter, stainless steel sump.

Project Name	Ciltura mia Cauma		01.08	WS-14	1 of 11
Project Location Start/End Date Driller/Equipment Geologist/Engineer Sample Method	6/22/2004 to 7/3 Boart Longyea	Avenue Portland, Ore 9/2004 //Rotosonic	egon	TOC Elevation (fee Surface Elevation ( Northing Easting Hole Depth Outer Hole Diam	,
i			u v	Soil Description	
Debth (Leet, BGS)  Well Details	Interval Percent Recovery Collection	Name (Type)	Blows/6" Lithologic Column		
	100 C	В		0.0 to 1.3 feet: GRAVELLY SILT (ML); non plastic; 30% gravels, fine, sub	dark yellowish-brown; 70% fines, angular; trace organic debris; dry.
A   A   A   A   A   A   A   A   A   A		PID = 0ppm.		1.3 to 10.0 feet: SILTY SAND (SM); da 50-60% sand, fine; damp.	rk gray; 40-50% fines, low plasticity;
2	<b>80%</b> C				
27 27 27 27 27 27 27 27 27 27 27 27 27 2	- 95% C	<i>PID</i> = 0ppm.		@ 5.0-feet: Increased fines to 50%.	
		PID=0ppm.			
10				@ 9.5-feet: slight odor.  10.0 to 11.0 feet: SAND (SP); light gray fines; no noticeable odor; damp.	vish-brown; 100% sand, fine; trace
_ 12	- 100 C	В		11.0 to 14.0 feet: SAND (SP); light graf fines; trace gravels, fine to coarse; tarr-like balls; damp.	vish-brown; 100% sand, fine; trace trace organic debris; slight odor;
_ 13		PID = 0ppm.			
15				14.0 to 16.0 feet: SAND (SP); light graj fines; trace organic debris; no noti	vish-brown; 100% sand, fine; trace ceable odor; damp.
. 17	- 100 C	B PID = 0ppm.	000	16.0 to 18.5 feet: GRAVELLY SAND ( fine; 30% gravels, fine to medium,	SP); light grayish-brown; 70% sand, subangular; trace fines; damp.
_ 18		DID COM	0.00	18.5 to 22.0 feet: SAND (SP); dark yell trace fines, non plastic; damp.	lowish-brown; 100% sand, fine;
20		PID = 0ppm.			

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly viryl chloride. 6. Odor characteristic of manufactured gas plant waste.

Vlaul	Foster &	Alongi, l	Inc.	Project N <b>8128.0</b>	umb	er	Borehole Log/Well Cor Well Number WS-14	Sheet 2 of 11
Depth (feet, BGS)	Well Details	Interval Percent Recovery	Collection Method S	mple Data  Particle (Type)  Name (Type)	Blows/6"	Lithologic Column	Soil Descripti	
21		- 100	СВ	PID = 0ppm.			22.0 to 22.5 feet: SILT (ML); light brow	rnish-gray; 85% fines, low plastic
23		- <sub>100</sub>	СВ				15% sand, fine; trace gravels, fine organic debris; trace woody debriz 22.5 to 23.5 feet: SAND (SP); dark yet trace fines, non plastic; damp.  23.5 to 26.0 feet: GRAVELLY SILT (Note that the medium plasticity; 35% gravels, file.	s; damp. llowish-brown; 100% sand, fine; IL); light grayish-brown; 65% fine
25 26				PID = 0ppm.			sand; moist.	
27		100	СВ	PID = 29.7ppm	_		26.0 to 29.0 feet: GRAVELLY SILT (M medium plasticity; 35% gravels, fi sand; strong sheen and odor; pos	ne to coarse, subangular; trace
29 30							29.0 to 33.0 feet: SANDY SILT (ML); on plasticity; 35% sand, fine; heavy son possible product; moist.	
31 32 33		<sup>-</sup> 100	СВ	PID = 8.1ppm.				
34 35				PID = 0ppm.			33.0 to 35.0 feet: SILTY SAND (SM); plasticity; 60% sand, fine; subrour diameter; heavy sheen and odor;	nded clast approximately 5-inch moist.
36 37		90	СВ	PID = 0ppm.			35.0 to 35.5 feet: SAND (SP); light yel fines, non plastic; heavy sheen ar 35.5 to 38.5 feet: SAND (SP); dark bro fines, non plastic; heavy sheen ar	nd_odor; moist ownish-gray; 100% sand, fine; tr
38 39				PID = 0ppm.			38.5 to 52.5 feet: SILTY SAND (SM); to low plasticity; 75% sand, fine; tr odor; wet.	dark brownish-gray; 25% fines, r ace gravels, subangular; strong
40 41 42		- 100	СВ	PID = 8ppm.				
NOTES:							l head space reading in parts per million. 3. © E= poly vinyl chloride. 6. Odor characteristic	

viau	I Foster & A	AlOi	igi,	IIIC.		Project N <b>8128.</b> 0		21	Well Number <b>WS-14</b>	Sheet <b>3 of 11</b>
(SE	Well		ج ر	S S	ample			ıic	Soil Description	
(feet, BGS)	Details	Interval	Percent Recovery	Collection Method 🤵	Number	Name (Type)	Blows/6"	Lithologic Column		
<b>1</b> 3		Ī								
44						PID = 0ppm.				
<b>4</b> 5										
16										
16										
<b>17</b>						PID = 0ppm.				
18						пр-оррии.				
19										
50						DID Owner				
51						PID = 0ppm.				
1										
2										
3									52.5 to 53.0 feet: SILT (ML); dark brown 10% sand, fine; strong odor; moist to	ish-gray; 90% fines, low plastic
. ,						PID = 0ppm.			53.0 to 55.5 feet: SILTY SAND (SM); da to low plasticity; 75% sand, fine; trad	rk brownish-gray; 25% fines, r
34									odor; wet.	o g.avo.o, casagaa., c. og
55										
56									55.5 to 56.0 feet: SILT (ML); dark brown 10% sand, fine; strong odor; moist to	ish-gray; 90% fines, low plastic
	<b>∞</b> ∞ ∞		100	СВ		PID = 0ppm.			56.0 to 58.0 feet: SAND WITH SILT (SP	-SM); dark brownish-gray; 15%
57									fines, non plastic; 85% sand, fine; st	rong odor, wet.
58										
59									58.0 to 66.0 feet: SILTY SAND (SM); da non to low plasticity; 75 to 80% sand strong odor; wet.	rk brownish-gray; 15 to 20% til d, fine; trace cobbles, subroun
19						PID = 0ppm.			Strong odor, wet.	
60									@ 60.0 feet: 3-inch silt layer.	
1										
_			90	СВ						
52						PID = 0ppm.				
33										
64									@ 63.5.0 feet: odor becoming slight.	
65										

	Maul Foster & Alongi, Inc.											.og/Well Con	
	Mau	I Fost	er & A	Alor	ngi, I	Inc.		Project N <b>8128.</b> 0		er		Number S-14	Sheet <b>4 of 11</b>
-		<u> </u>	A/all	1					71.00	1	VV		
	Depth (feet, BGS)		Vell etails	Interval	Percent Recovery	Collection Method C	Number ample	Name (Type)	Blows/6"	Lithologic Column		Soil Descriptio	on
		× ×	×					PID = 0ppm.		<u> </u>	]		
	66							"					<u>-</u>
	67			ľ	100	СВ					to low plasticit wet.	ty; 20% sand, fine; m	ark grayish-brown; 80% fines, non icaceous; moderate odor; moist to
	68			ı							67.0 to 69.5 feet: 3 95% sand, fin	SAND (SP); dark gra e; micaceous; no not	yish-brown; 5% fines, non plastic; ticeable odor; moist to wet.
	69			ı				PID = 0ppm.			@ 68.0 feet: 2-inc	h silt layer.	
	70										69.5 to 70.0 feet:	SILT (ML); dark gray;	85% fines, low plasticity; 15%
											sand, fine; mo 70.0 to 71.0 feet: \$	oist.	yish-brown; 5% fines, non plastic;
	_ 71				0	СВ		PID = 0ppm. WS14-W-71			71.0 to 75.5 feet: N		
	_ 72												
	_ 73 -												_
	_ 74												_
	_ 75												
	_ 76			I	100	СВ		PID = 9.4ppm	•		75.5 to 81.5 feet: 3 plastic; 95 to 1	SAND (SP); dark bro 100% sand, fine; mica	wnish-gray; trace to 5% fines, non aceous; slight odor; wet.
	_ 77			ı									<u> </u>
	- _ 78			L	100	СВ		PID = 0ppm.					
	- _ 79										@ 79.0 feet: trace	e silty balls.	
	80											,	
	81							PID = 0ppm.					
20,	_ _ 82							по-оррии			81.5 to 82.5 feet: sand, fine; slig	SILT (ML); dark gray; ght odor; wet.	90% fines, medium plasticity; 10%
3PJ 4/13/	_ 83									HHH	82.5 to 83.5 feet: 3 moderate odd		y; 100% sand, fine; trace fines;
S14-17.G	- _ 84							PID = 0ppm.			sand, fine; slig	ght odor; wet.	90% fines, medium plasticity; 10%
128-01\W	85										moderate odo	r; wet.	y; 100% sand, fine; trace fines;  ML); dark gray; alternating 1/4-inch
GBLWC W:\GINT\GINTW\PROJECTS\8128-01\WS14-17.GPJ 4/13/07	_ 86							WS14-W-86			to 1/2-inch sai	nd and silt layers; we SAND (SP); dark gra	
GINTW/P	_ 87							PID = 0ppm.					
C W:\GINT\	NOTE												GW = groundwater sample, dashed graphic of manufactured gas plant waste.
GBLW.													

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

Maul Foster & Alongi, Inc.						Project N <b>8128.</b> 0		er	Well Number <b>WS-14</b>	Sheet <b>5 of 11</b>
(feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method 👷	ample Numper	Data     Name (Type)	Blows/6"	Lithologic Column	Soil Descripti	ion
		Int	100	ပိ∛   <b>CB</b>	Nr		BK	४६   ज्यासन	87.5 to 88.0 feet: SANDY SILT (ML); g	pray: 60% fines low to medium
38 39		I	700						plasticity; 40% sand, fine; micace 88.0 to 89.5 feet: SILTY SAND (SM); sand, fine; micaceous; slight odor,	ous; moderate odor; wet. gray; 15% fines, non plastic; 85%
90		ı				PID = 13ppm.			89.5 to 90.5 feet: SILT (ML); dark gray trace sand, fine; micaceous; mois	
)1									90.5 to 92.0 feet: SILTY SAND (SM); sand, fine; micaceous; sheen and	
92									92.0 to 96.0 feet: SILT (ML); gray; 100 trace sand, fine; micaceous; shee	n and strong odor; moist.` Sever
)3 )4		ı			F	PID = 28.3ppn	1.		zones of 2-inch pockets with fine :	sand.
)5		ı								
96		L	100	СВ					96.0 to 98.0 feet: SANDY SILT (ML); o	dark grov 95% finas madium
7		ı	100	СВ		PID = 0ppm.			plasticity; 15% sand, fine; micaced	
8		ı							98.0 to 102.0 feet: SAND (SP); dark g	ray; 5% fines, non plastic; 95% s
9						PID = 0ppm.			fine; micaceous; strong odor; wet. 1/2-inch silt bands intermixed with	
)O )1									@ 100.5 feet: 1-inch silt layer.	
)2		ı				WS14-W-101				
3			100	СВ		PID = 0ppm.			102.0 to 105.0 feet: SAND (SP); gray; fines; sheen and strong odor; wet.	100% sand, fine; micaceous; tra
)4										
5						PID = 84ppm.	,		105.0 to 105.5 feet: SILT (ML); gray; 9	0% fines, low plasticity; 10% sar
6									fine; strong odor; moist. 105.5 to 106.0 feet: SAND (SP); gray; fines; sheen and strong odor; wet. 106.0 to 108.0 feet: SILT (ML); gray; 1	
)7									fine; trace rootlets; moderate odol @ 107.0 feet: 2-inch gray sand layer v	; moist.
18 19						PID = 9.5ppm	_		108.0 to 108.5 feet: SILTY SAND (SM sand, fine; sheen and strong odor	wet.
10									108.5 to 110.5 feet: SILT (ML); gray; 1 fine; sheen and strong odor; mois @ 109.0 feet: 4-inch silty sand layer w	t.
VOTE									head space reading in parts per million. 3. C=poly vinyl chloride. 6. Odor characteristic	

Maul Foster & Alongi, Inc.					Project Number				Borehole Log/Well Construction  Well Number Sheet	
				8128.01.08				WS-14	6 of 11	
Depth (feet, BGS)	Details	Interval	Percent Recovery	Collection Method S	ample Number	Name (Type)	Blows/6"	Lithologic Column	Soil Descriptio	n
_111			100	СВ		PID = 0ppm.			110.5 to 111.0 feet: SAND (SP); gray; fines; slight odor; wet. 111.0 to 113.0 feet: NO RECOVERY; s	
_113						PID = 0ppm.			113.0 to 114.0 feet: SANDY SILT (ML), non to low plasticity; 40% sand, fine	dark brownish-gray; 60% fines, e; micaceous; faint odor; moist to
_114 115		ı							wet. 114.0 to 120.5 feet: SAND (SP); dark b 95% sand, fine; micaceous; no not	rownish-gray; 5% fines, non plasti
_116						PID = 0ppm.			@ 116.0 feet: 3-inch silt layer.	
_118										
119		ı				PID = 0ppm.				
120		L				WS14-W-120	)		120.5 to 121.0 feet: SILT (ML); dark bro plasticity; 15% sand, fine; micaceo	ownish-gray; 85% fines, low us: moist
_122 123			100	СВ					121.0 to 132.5 feet: SAND (SP); dark g micaceous; wet.	
124		ı				DID Owner			@ 4045 st.	
125		ı				PID=0ppm.			@ 124 feet: sheen and strong odor pre	sent.
126										
127	10101 00 01010 00 10101 00 10101 00 10101 01 10101 01					PID=0ppm.				
129	10101 100 01010 01 10101 00 10101 01 10101 01									
130						PID=0ppm.			@ 130 feet: sheen and strong odor fad	ing.
129 130 131 132										
NOTE								<u> </u>	il head space reading in parts per million. 3. G	

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly viryl chloride. 6. Odor characteristic of manufactured gas plant waste.

	Maul Foster & Alongi, Inc.								Borehole Log/Well Construction		
Maı	ıl Foster & A	loi	ngi, I	lnc.		Project N		er	Well Number	Sheet	
						8128.0	01.08		WS-14	7 of 11	
Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method S	ample           	Data   Name (Type)	Blows/6"	Lithologic Column	Soil Descriptio	n	
De (fe		Int	Pe Re	ŠŠ	Nu	/ tai/10 (1)po/	ЭВ	Lit Co			
-								пппппп	132.5 to 133.5 feet: SILT (ML); dark gra	evish-brown: 90% fines low	
_133	00000 00 00000 00					PID = 0ppm.			plasticity; 10% sand, fine; micaceou		
Ē	00000 00					РІБ=Оррті.		ЩЩЩЩ			
<u> 134</u>	00000 00								133.5 to 134.0 feet: SAND (SP); dark g micaceous; wet.	ray; 100% sand, fine; trace fines;	
	00 00 00 00 00 00 00 00 00								134.0 to 134.5 feet: SILT (ML); dark gra		
E 135									plasticity; 10% sand, fine; micaceou	us; moist.	
E	00000 00 00000 00								134.5 to 136.0 feet: SAND (SP), dark g	ray; 100% sand, fine; trace fines;	
Ē 126		₽	0	СВ					micaceous; wet. @ 135.5 feet: 3-inch silt layer.	-	
_136								h	136.0 to 138.5 feet: NO RECOVERY.		
Ē	00000									=	
137										_ <u>-</u>	
E										=	
_138										_ <u>=</u>	
E											
139			100	CB					138.5 to 141.5 feet: SAND (SP); dark g sand, fine; micaceous; slight odor; v		
ŧ						PID = 0ppm.			Sand, line, micaceous, siigin odor, t	76t. =	
E 140										3	
F										<u> </u>	
141											
E'4'										=	
Ē , ,	[환화] [1] -							hinnin	141.5 to 142.0 feet: SILT (ML); dark bro	ownish-arav: 85% fines. low	
<u>=</u> 142		₽	100	СВ		DID O		HHHHH	plasticity; 15% sand, fine; micaceou		
E	점점점 점					PID = 0ppm. WS14-W-142			@ 141.7 feet: 1-inch sand layer. 142.0 to 143.0 feet: SAND (SP); gray; 1	1000/ cond fine: trace fines: wat	
143								haaal	143.0 to 145.0 feet: SILT (ML); gray; 10		
E									plasticity; trace sand; moist.	o 70 III les, mediam to riigir	
<u> 144</u>									@ 143.5 feet: 3-inch sand layer.		
Ē										4	
_145											
Ė						PID = 0ppm.			145.0 to 148.5 feet: SILT (ML); gray; 10 plasticity; intermixed with 1-inch to	10% tines, medium to nigh 2-inch sand lavers: moist.	
<u> 146</u>									p, ,		
Ē										<u> </u>	
147											
Ē											
148											
E	::::::::										
149								医器型	148.5 to 149.0 feet: SAND (SP); gray; 1	00% sand, fine; trace fines; wet.	
F. 70						PID = 0ppm.		TMTMT	149.0 to 149.5 feet: SILT (ML); gray; 10	00% fines, medium to high	
§ 150									plasticity; trace sand; moist.	1000/ cond fine trace fines wet	
150			100	СВ		WS14-W-150	,		149.5 to 150.0 feet: SAND (SP); gray; 1 150.0 to 167.0 feet: SAND (SP); gray; 5		
						[			fine to medium; trace wood debris;		
5 <u>151</u>	[888]   1									-	
-418 -418 -418										= = = = = = = = = = = = = = = = = = = =	
152 5						PID = 0ppm.			@ 152.0 feet: 2-inch silt layer.	=	
128-(	:::::計:									= = = = = = = = = = = = = = = = = = = =	
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<u> 155</u>											
GBLWC W.\GINTTAPROJECTS\8128-01\WS14-121	<b>ES:</b> 1. CB = 4x6-inc	h core	e barrel s	soil sam	pler. 2.	PID = Photo io	nizatioi	n detector, soil	I head space reading in parts per million. 3. G	W = groundwater sample, dashed graphic	
W:\C	indicates approx	imate	screene	ed interv	al. 4. l	bgs = below grou	und su	rface. 5. PVC	C = poly vinyl chloride. 6. Odor characteristic o	if manufactured gas plant waste.	
WC W											
GBL											

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly viryl chloride. 6. Odor characteristic of manufactured gas plant waste.

Maul Foster & Alongi, Inc.					Project Number 8128.01.08				Borehole Log/Well Cons Well Number WS-14	Sheet <b>8 of 11</b>
Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method S	ample Number		Blows/6"	Lithologic Column	Soil Description	
156		I				PID=0ppm.			@ 155.0 feet: Wood fragments.	
157									@ 157.0 feet: 3-inch silt layer.	
158		ı				PID = 0ppm.			ŕ	
159		ı								
160										
161 162						PID = 0ppm.				
163	10101010101 10101010101 10101010101 10101010									
164	10 10 10 10 10 10 10 10 10 10 10 10 10 1					PID=0ppm.				
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166	00000000000000000000000000000000000000	ı								
167	0101010101 000000101 000000101 000000101	ł	100	СВ		PID = 0ppm. WS14-W-167	•		167.0 to 167.5 feet: NO RECOVERY; sl	
168	DODODODO DODODODO DODODODO DODODODO DODODODO DODODODO DODODODO					11314-11-101			167.5 to 169.5 feet: SAND (SP); gray; 1 fines; wet.	uu% sand, īine; micaceous; trac
169 170	000000000 0000000 0000000 0000000 000000	ı							169.5 to 172.0 feet: SAND (SP); gray; 1	 00% sand, fine; micaceous;
171	\[ \partial \pa	ı				PID = 0ppm.			increasing fines to 15%; wet.	
172									172.0 to 173.0 feet: SILTY SAND (SM);	aray 35% fines non plactic 65%
173	70 70 70 70 70 1 10 10 10 10 10 1 20 10 10 10 10 1 20 10 10 10 10 1					PID = 0ppm.			sand, fine; wet. 173.0 to 182.0 feet: SAND (SP); gray; 1	
174	\$J\$J\$J\$J\$ J\$J\$J\$J\$J\$ \$J\$J\$J\$J\$J\$ J\$J\$J\$J\$J\$ J\$J\$J\$J\$J\$								fines; wet.	
175	10101010101 0101010101 1010101010 101010101									
174 175 176 177 <b>NOTE</b>	01101101011 010100000101 0101000101 0101000101					PID = 0ppm.				
177			100	СВ						

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly viryl chloride. 6. Odor characteristic of manufactured gas plant waste.

							G	eologic	Borehole Log/Well Construction		
Mau	I Foster & A	lo	ngi, l	nc.	Project Number				Well Number	Sheet	
	T	_			8128.01.08				WS-14	9 of 11	
Depth (feet, BGS)	Well Details		ery rt	, io Si	ample	Data '		gic	Soil Description	1	
oth et, B	Dotano	Interval	Percent Recovery	Collection Method 🤵	Number	Name (Type)	Blows/6	Lithologic Column			
De) (fee		Inte	Pe	Š	Na	Name (Type)	Blo	Cort			
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178	00000000000000000000000000000000000000										
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179	00000000 00000000 00000000					DID Owner				_	
	00000000 00000000					PID = 0ppm.				=	
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181	000000000										
										<u> </u>	
182	000000000										
	00000000		80	СВ		PID = 0ppm.			182.0 to 185.5 feet: NO RECOVERY; slu	iff.	
183	000000000 000000000					WS14-W-182					
	000000000 00000000									<u> </u>	
184	00000000 000000000 00000000									Ī	
										1	
185											
- 700	000000000 00000000										
186	00000000							88888	185.5 to 186.5 feet: Sand (SP); gray; 10	0 % sand, fine; micaceous; trace	
-/00						PID = 0ppm.			fines; wet.	=	
107	00000000							kerel	186.5 to 188.0 feet: SILTY SAND (SM);	gray; 35% fines, low plasticity; 65%	
<u> </u>	00000000000000000000000000000000000000	ı							sand, fine; wet.		
100	000000000 00000000	ı								=	
_188										0% fines, low to medium plasticity;	
400	000000000								damp.		
<u> 189</u>	000000000 00000000					PID = 0ppm.			@ 189.0 feet: 2-inch fine, sand layer.	=	
- 400	00000000					''			•	=	
_190								111111111111111111111111111111111111111	190.0 to 195.0 feet: SAND (SP); gray; 1	00% sand. fine: micaceous: trace	
E ,,,	000000000 00000000								fines; wet.		
<u>-</u> 191	00000000 0000000										
Ē ,	000000000 000000000 00000000	ı								=	
_192	00000000 00000000	₽	100	СВ		D/D 0					
Ē	000000000	ı	700			PID = 0ppm.					
_193	000000000 00000000									<u>.</u>	
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_194										<u>.</u>	
	000000000 000000000	ı									
_195	00 00 00 00 00 00 00 00 00 00 00 00 00	ı				PID = 0ppm.			195.0 to 196.0 feet: SILTY SAND (SM);	grav: 50% fines low plasticity: 50%	
Ē	00000000 00000000 00000000	ı				гід = орріп.			sand, fine; wet.	gray, 30% iii les, low plasticity, 30%	
196	000000000 000000000									00% sand fine: microcours: trace	
E	00000000 00000000								196.0 to 197.0 feet: SAND (SP); gray; 1 fines; wet.	oo sanu, iine, micaceous, trace	
197	000000000 00000000			CD					•	00/ finos modium to high	
<u> </u>			90	СВ		WS14-W-197				บ% แก่es, mealum to nigh	
198	000000000 00000000 00000000					DID A		ЩЩЩ		000/ pand fine to west	
Ē	000000000 000000000					PID = 0ppm.			198.0 to 204.0 feet: SAND (SP); gray; 1 micaceous; trace fines; wet.	UU% sand, fine to medium;	
199	000000000 000000000								-, <del></del> ,		
Ė	00000000 00000000										
200	00000000 00000000										

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

#### WS14 Completion Details

Oregon Water Resources Department Well Start Card Number: 164731 Oregon Water Resources Department Well Identification Number: L67967

#### Boring:

0.0 to 69.0 feet bgs: 10-inch temporary, threaded steel, isolation casing. 0.0 to 110.0 feet bgs: 9-inch temporary, threaded steel, isolation casing. 0.0 to 135.0 feet bgs: 8-inch temporary, threaded steel, isolation casing. 0.0 to 210.0 feet bgs: 6-inch temporary, threaded steel, isolation casing. 0.0 to 210.0 feet bgs: 4x6-inch core barrel sampler.

0.0 to 1.5 feet bgs: flush mount vault and cement seal.

1.5 to 7.0 feet bgs: 1/4-inch Baroid bentonite chips hydrated with potable water.

7.0 to 104.0 feet bgs: bentonite grout slurry, 10.0 pounds per gallon. 104.0 to 106.0 feet bgs: 20x40 washed Colorado silica sand, secondary filter pack.

106.0 to 125.0 feet bgs: 10x20 washed Colorado silica sand, primary filter pack.

125.0 to 140.0 feet bgs: non-IPA coated, 1/4-inch bentonite pellets hydrated with potable water.

140.0 to 142.0 feet bgs: 20x40 washed Colorado silica sand, secondary filter pack.

142.0 to 161.0 feet bgs: 10x20 washed Colorado silica sand, primary filter pack.

161.0 to 210.0 feet bgs: non-IPA coated, 1/4-inch bentonite pellets hydrated with potable water.

GBLWC

NOTES:

			Geologic Borehole Log/Well Construction							
Mau	I Foster & A	longi, Inc.	Project N	lumber	Well Number	Sheet				
			8128.0	1.08	WS-14	11 of 11				
Depth (feet, BGS)	Well Details	Interval Percent Recovery Collection Method	Sample Data   อี๋๋๋๋๋๋๋๋๋๋   มี Name (Type)	Blows/6" Lithologic Column	Soil Description	on				

#### Well WS14-125:

0.0 to 109.0 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe. 109.0 to 124.0 feet bgs: 2-inch diameter, stainless steel wire wrapped screen, 0.010-slot.

124.0 to 125.0 feet bgs: 2-inch diameter, stainless steel sump.

## Well WS14-161:

0.0 to 145.0 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe. 145.0 to 160.0 feet bgs: 2-inch diameter, stainless steel wire wrapped screen, 0.010-slot.

160.0 to 161.0 feet bgs: 2-inch diameter, stainless steel sump.

# ATTACHMENT B

**SPECIAL STANDARDS** 





Water Resources Department

North Mall Office Building 725 Summer St NE, Suite A Salem, OR 97301 Phone (503) 986-0900 Fax (503) 986-0904 www.wrd.state.or.us

January 26, 2015

TRENT CASTNER MWC# 10306 CASCADE DRILLING LP 13600 SE AMBLER ROAD CLACKAMAS, OREGON 97105

## FINAL ORDER

Dear Mr. Castner:

The Special Standards Request Form you submitted for owner: Siltronic Corporation, Start Card number 1025432 (Client Number WS-11) is hereby approved for the following: You may abandon this nested monitoring well as described in your Special Standards Request Form. You may use an Organoclay based grout (see attached) to abandon the over drilled monitoring well in the intervals where NAPL is present. In intervals where NAPL is not present an approved sealing material shall be used. If you are going to use bentonite grout to abandon the well, then it may only be used to abandon the portion of the well that is below the static water level. Above the static water level another approved sealing material must be used. A copy of your Special Standards Request Form is enclosed. All other standards must be adhered to.

The Well Construction Standards serve to protect ground water resources. By approving and issuing this special construction standard the Oregon Water Resources Department is not representing that a well constructed in accordance with this condition will maintain structural integrity or that it meets engineering standards. The well constructor/or landowner is responsible for ensuring that a well is constructed in a manner that protects ground water resources as required under Oregon Administrative Rules 690-200 through 690-240.

If you have any questions regarding this letter, I may be contacted at (503) 986-0852, or by e-mail at Joel.W.Jeffery@wrd.state.or.us.

Sincerely,

Joel Jeffery, Coordinator Well Construction Program

Well Construction and Compliance Section

enclosure

cc: NW Region Well Inspector

File

This is a final order in other than a contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review must be filed within the 60 day time period specified by ORS 183.484(2). Pursuant to ORS 536.075 and OAR 137-004-0080 you may either petition for judicial review or petition the Director for reconsideration of this order. A petition for reconsideration may be granted or denied by the director, and if no action is taken within 60 days following the date the petition was filed, the petition shall be deemed denied.



# **Special Standards**

**Request Form** 

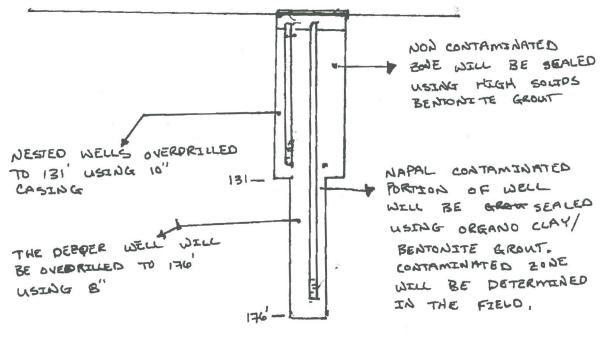
# REQUEST FOR WRITTEN APPROVAL TO USE CONSTRUCTION METHODS NOT INCLUDED IN OREGON ADMINISTRATIVE RULES 690-200 THROUGH 690-240

Before the request can be considered, this form must be completed. Requests shall be submitted to the Well Construction Program Coordinator, Water Resources Department, 725 Summer Street NE, Suite A, Salem OR 97301-1266. Requests may also be considered by the appropriate Regional Manager.

Date	of request:1/21/2015											
Bond	led Well Constructor (name, license #, and mailing address): Trent Castner 10306											
	13600 SE Ambler RD, Clackamas, OR 97105											
(1)	Location of Well: <u>SW</u> 1/4 <u>SW</u> 1/4 Tax lot <u>1200</u> Section <u>13</u> ,											
	Township 1 N, Range 1 W, Multnomah County											
	Address at well site: 7200 NW Front Ave., Portland, OR											
(2)	Start Card Number(s)(for work to be done):											
(3)	Name and Address of Land Owner: Siltronic Corporation											
	7200 NW Front Ave, Portland, OR											
(4)	Distance to the nearest septic tank, drainfield, closed sewage line (if water supply well)											
	Unkown											
(5)	The unusual site conditions which necessitate this request: Abandonment of a nested											
	well in a known NAPAL contaminated zones which will prevent the hydration of the bentonite in											
	the high solids slurry.											
(6)	The proposed construction methods that the bonded well constructor believes will be adequate for this well: (attach additional pages if needed)											
	I propose that we overdrill the nested well (original start card number 147655 client number WS-11) and that we											
	use a high solids bentonite grout combined with Oragano Clay in the zones determined to											
	be contaminated with NAPAL. The rest of the well borehole will be abandoned using high solids benonite slurry.											

JAN 2 3 2015

(7)Diagram showing the pertinent features of the proposed well design and construction: (attach additional pages if needed)



SCALE. SEE COHOTATA ORIGINAL WELL LOG NOT

#### PLEASE NOTE:

- The Well Construction Standards serve to protect ground water resources. By approving (1)and issuing this special construction standard the Oregon Water Resources Department is not representing that a well constructed in accordance with this condition will maintain structural integrity or that it meets engineering standards. The well constructor/or landowner is responsible for ensuring that a well is constructed in a manner that protects ground water resources as required under Oregon Administrative Rules 690-200 through 690-240.
- (2)If it should be determined at some future date that the well, due to its construction, is allowing ground water contamination, waste or loss of artesian pressure, the undersigned shall return to the site and rectify the problem.
- (3)If oral approval was granted, a written request must be submitted to the Department either within three (3) working days of the date of oral approval or prior to the completion of the associated well work. Failure to submit a written request as described above may void prior oral approval.

I have read and understand the above information. I further attest that the information provided is accurate to the best of my knowledge.

Bonded Constructor Signature: 4. Just Castra

SEE ATTACHED WORK

JAN 23 2015

Revised 7/26/2006

Special Standards Request Form /2

WATER RESOURCES DEPT SALEM, OREGON

# HAHN AND ASSOCIATES, INC.

**ENVIRONMENTAL CONSULTANTS** 

RECEIVED

September 18, 2008

SEP 29 2008

Mr. Kristopher Byrd
Oregon Water Resources Department
Well Construction and Compliance Section
458 12<sup>th</sup> Street NE, Ste. A
Salem, Oregon 97310

WATER RESOURCES DEPT SALEM, OREGON

alem, Oregon 97310 HAI Project Nos. 2708 and 5237
DEQ ECSI File No. 84

SUBJECT: Alternative Grout Slurry for Borehole Abandonment and Seal for Permanent Groundwater Monitoring Wells, NW Natural Gasco Property, 7900 NW St, Helens Road and Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon

Dear Mr. Byrd:

725 Summer

Hahn and Associates, Inc. (HAI), on behalf of NW Natural, is requesting approval from the Oregon Water Resources Department (OWRD) for the use of a site-specific bentonite grout for soil boring abandonment work and well sealant for future groundwater monitoring or groundwater extraction wells installed as part of site investigation and cleanup activities at the above referenced contiguous properties (the Site).

NW Natural is conducting investigation and clean-up activities at the Site with oversight from the Oregon Department of Environmental Quality. The site has been impacted predominantly by polynuclear aromatic hydrocarbons, benzene, and cyanide. Trichloroethene and related degradation products have also been detected. Dissolved phase contamination and dense non aqueous phase liquid (DNAPL – a creosote-like oil with a density greater than water) are present at the Site.

As specified in OAR 690-240-0475, well seal material shall consist of a physically and chemically stable hydrated grout consisting of 1) neat cement; or 2) sodium bentonite; or 3) a cement-bentonite grout mixture containing no more than 5 percent bentonite by dry weight; or 4) sodium bentonite granules, pellets, or chips placed in an unhydrated state and subsequently hydrated downhole. OAR 690-240-0475 acknowledges that appropriate sealing materials may vary depending on site characteristics and substances being monitored.

As part of the pre-design process related to a pending source control action at the Site, Glynn Geotechnical Engineering has recently completed testing the compatibility and effectiveness of various bentonite and cement grout slurry sealing materials with contaminated groundwater and dense non aqueous phase liquids (DNAPL) obtained from the site. As provided within the attached letters of August 22 and 28, 2008 (Mark Glynn to Mike Crystal), it has been determined that a bentonite / Organoclay blend, consisting of approximately 9 parts Wyoming sodium bentonite and 1 part Organoclay by volume, and mixed to a 20% solids content, will be a superior sealant as compared to the sodium bentonite or cement bentonite grout slurries specified in OAR 690-240-0475.

The specific mixture that has been tested and recommended for use consists of granular CETCO Volclay CG-50 and PM-200 Organoclay. Technical data sheets for both of

these products are attached. A technical reference document is also attached that describes the applicability and function of Organoclay as a sealant in situations where high concentrations of organic contaminants are present. Please be advised that although the CG-50 product is not marketed by CETCO as a well seal material, the supplier has indicated that it is the same bentonite source that is marketed for differing uses under various names. An advantage to the CG-50 and PM-200 Organoclay mixture is that granular sizing of the two products is similar which better ensures a homogenous blend, and that CETGO can pre-mix and bag the 9:1 bentonite / Organoclay blend — thereby eliminating the need to prepare the proper blend in the field.

Testing by Glynn Geotechnical Engineering has determined that to achieve a slurry that is 20% solids (by volume), a single bag of the blend weighing 50 pounds should be mixed with 18.26 gallons of water. The solution should be blended with an electric paddle mixer. The resulting mud weight of the 20% solids solution will be 71.7 pounds per cubic foot (plus or minus 1 pound per cubic foot). The preceding equates to a mud weight of between approximately 9.5 to 9.7 pounds per gallon at a 20% solids content.

We are seeking approval from OWRD and DEQ to use the bentonite / Organoclay grout slurry mixture described above for those applications necessitating the use of a grout slurry sealant. All requirements concerning placement method and appropriate depth of placement within the borehole or well annulus, as well as verification of the appropriate mud weight, will remain as specified within OAR 690-240. Approval from the DEQ for use of the bentonite / Organoclay grout slurry described herein is being requested concurrently with this request to OWRD.

Should you have any questions, please contact the undersigned.

Sincerely.

Rob Ede, R.G.

Principal

robe@hahnenv.com

c: Mr. Bob Wyatt, NW Natural

Ms. Patty Dost, Schwabe, Williamson & Wyatt

Mr. Carl Stivers, Anchor Environmental, L.L.C.

Mr. John Edwards, Anchor Environmental, L.L.C.

Mr. Dana Bayuk, DEQ NW Region

Mr. Henning Larsen, DEQ NW Region

no B. Sle

Mr. Tom Gainer, DEQ NW Region

Mr. Tom McCue, Siltronic Corporation

RECEIVED

SEP 29 2008

WATER RESOURCES DEPT SALEM, OREGON

# ATTACHMENT A

Glynn Geotechnical Engineering Documentation: Well Seal Evaluation and Recommendations

Correspondence dated: August 22, 2008 and August 29, 2008

RECEIVED

SEP 2 9 2008

WATER RESOURCES DEPT SALEM, OREGON



a member of the GLYNN GROUP

August 22, 2008

Sevenson Environmental Services 2749 Lockport Road Niagara Falls, NY 14304

ATTN: Mr. Michael D. Crystal Vice President

SUBJECT:

Well Seal Evaluation

Gasco Site, Portland Oregon

GGE 05-1043C

Dear Mr. Crystal:

In response to your request I have reviewed the current issue regarding the failure of sealing materials in groundwater wells at the Gasco site. Based on substantive test data, it is my professional opinion that the bentonite/organo clay blend would be an effective replacement for plain bentonite grout in the construction of groundwater monitoring wells at the Gasco site.

By way of a few past projects, Glynn Geotechnical Engineering (GGE) has tested a recipe of bentonite and organo clay as a sealant against groundwater that contained significant DNAPL hydrocarbons. In each and every case the bentonite/organo clay blend, consisting of approximately 9 parts Wyoming bentonite and 1 part organo clay by volume, has demonstrated a compatibility with the groundwater at a permeability of less than 1.0E - 007 cm/sec. In general, the testing has indicated the permeability tends to decreases over time as result of continuing swell characteristics of the blend.

Within the past month a test of the compatibility/permeability of the blend was completed for the Gasco project. In this test the blend was tested against the site groundwater and effectively demonstrated that the bentonite/organo clay would be an effective seal for Sevenson's patented sheeting system.

In our tests we have used bentonite identified as CETCO and Volclay. Results of our tests indicate no remarkable differences in the results from the different bentonites. These results tend to substantiate the supplier claims that the same Wyoming bentonite is sold under different names. Therefore, my recommendation for the use of the bentonite/organo clay blend is made irrespective of the identifier for the bentonite. Specifically I would support the use of CETCO Pure Gold Grout for the bentonite portion of the blend.

Please do not hesitate to contact me with any questions or comments.

Sincere

Consulting Engineer, Principal Oregon: 804/9 P.E.

822.08

GLYNN GEOTECHNICAL ENGINEERING

SEP 29 2008



August 29, 2008

Sevenson Environmental Services 2749 Lockport Road Niagara Falls, NY 14304

Attn: Mr. Michael D. Crystal

SUBJECT:

Well Seal Material Standards Gasco Site, Portland Oregon

GGE 05-1043C

Dear Mr. Crystal:

On August 22, 2008 I sent you a letter regarding my evaluation of a bentonite/organo clay blend that would serve as a proper seal for monitoring wells at the Gasco Site. The proposed blend is comprised of 90% bentonite and 10% Organo Clay by volume.

To achieve a solution of 20% solids (by volume), a single bag of the blend weighing 50 pounds should be mixed with 18.26 gallons of water. The mud weight of the solution, as testing in the lab is 71.7 pcf. This unit weight was determined 15 minutes after the addition of water. The field measured unit weight should be expected to vary by no more than 1.0 pcf. We suggest that the solution be blended with an electric paddle mixer.

Please contact me directly if you need additional information.

8.29.08

Sincerely,

Mark W. Glynn, P.E.

Consulting Engineer, Principal

RECEIVED

SEP 29 2008

# ATTACHMENT B

**Technical Data Sheets:** 

CETCO Volclay CG-50 and CETCO PM-200 Organoclay

# RECEIVED

SEP 29 2008

WATER RESOURCES DEPT SALEM. OREGON



# Volclay ® CG-50

Description:	Volclay CG-50 is a natural, granular, high-swelling Wyoming sodium bentonite recommended for lining/sealing applications involving moist								
	soils or those where it is necessar								
Applications:	Soil/bentonite liners; general sealing applications								
Composition:	Sodium bentonite is a hydrous si	licate of alumina primarily consisti	ng of						
		the clay mineral montmorillonite, which swells several times its own							
		volume when, wetted.							
Free Swell	كالمستور والمراجع والمراجع أوالمراجع المتحالة المراجع المتحالة المراجع المراجع المحاجج المراجع المحاجج المحاجج	24 ml/2g minimum (ACC 1010)							
Filtrate Loss:	18 ml maximum (API 13A)								
Moisture Content:	12 percent maximum as shipped								
Particle Sizing:	5 percent max. retained on a #10								
	15 percent max. passing a #200 mesh (75 mm) sieve (ASTM D422)								
Dry Bulk Density:	65 lbs/ft <sup>3</sup> (1,040 kg/m <sup>3</sup> ) typical								
Packaging:	50 lb (22.5 kg) multi-wall paper bags; 2000-lb (900 kg) or 4,000 lb (1,800								
	kg) super sacks; or bulk.								
Availability:	F.O.B. Lovell, WY. Quantities le	ess than 1 ton may be available loca	lly.						
Application	Primary Soil	Typical Application							
Information:	Type	Rate*							
	Sand	8-10 lbs/ft² (40-50							
	0.1	kg/m²)							
	Silt	4-8 lbs/ft <sup>2</sup> (20-50 kg/m <sup>2</sup> )							
	Clay	2-4 lbs/ft² (10-20 kg/m²)	1						
	*Application rates are for a soil/t	bentonite liner mixed in a layer 6 in	ches						
	(150mm) in thickness with a per-	meability of 1 x 10 <sup>-7</sup> cm/sec. Applic	ation						
		ational purposes only. All soils sho	uld be						
	tested to determine specific appli	cation rates.							

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Revised 3/03

1500 W. Shure Drive • Arlington Heights, IL. 60004 • USA • (847) 392-5800 • FAX (847) 577-5571 /www.CETCO.com A wholly owned subsidiary of AMCOL International





# PM-200 ORGANOCLAY

MATERIAL PROPERTY	TEST METHOD	VALUE
Bulk Density Range	CETCO Test Method	44 – 56 lbs/ft <sup>3</sup>
Particle Size Distribution	US Standard Sieve Size	
	No.10 (Retained)	1% Maximum
	No.30 (Retained)	70% Minimum
	No.50 (Retained)	25% Maximum
	No.100 (Retained)	3% Maximum
	No.100 (Passing)	1% Maximum
Hydraulic Conductivity	ASTM D 5084 modified	1 x 10 <sup>-3</sup> cm/sec minimum
Oil Adsorption Capacity	CETCO Test Method	0.5 lb of oil per lb of Organoclay minimum
Quaternary Amine Content	CETCO Test Method	25 – 33% quaternary amine loading

A proprietary granular clay compound that reliably adsorbs oil and similar organics from water.

Packaging - 1,500 lb. supersacks (with approximately 22-24 tons per flatbed truck).

Rev. 3 - 8/8/07



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66 SALEM OREGON

1500 West Shure Drive 5th Floor, Arlington Heights, IL 60004 USA 800.527.9948 Fax 847.577.5566
For the most up-to-date product information please visit our website, <a href="www.sedimentremediation.com">www.sedimentremediation.com</a>
A wholly owned subsidiary of AMCOL International Corporation

The information and data contained herein are believed to be accurate and reliable, CETCO makes no warranty of any kind and accepts no responsibility for the results obtained through application of this information.

# ATTACHMENT C

**CETCO Technical Reference** 

Organoclay Media as a Sealant Additive

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# REMEDIATION TECHNOLOGIES

Technical Reference

# RECEIVED UTILIZING ORGANOCLAY™ MEDIA AS A SORBENT ADDITIVE TO DECREASE ORGANIC MOBILITY AND SEP 2.9 2008 HYDRAULIC CONDUCTIVITY WATER RESOURCES DEPT

SALEM, OREGON

## BACKGROUND

Organic contaminants migrating with groundwater sources continue to offer significant challenges in terrestrial remediation applications. While selective media such as granular activated carbon (GAC) have proven to be successful at adsorbing soluble organics, these media may have reduced performance due

to blinding in the presence of high molecular weight organic matter and may be prematurely saturated due to the active sites competing for inorganic matter as well as the organic contaminants of concern. An alternative technology is emerging that addresses this problem with a clay-based adsorption media, which effectively and efficiently stabilizes low-soluble organic matter. Organoclay™ Media utilizes granular sodium bentonite clay, which has been chemically modified to attract organic matter without absorbing water. The unique platelet structure of bentonite provides tremendous surface area and the capacity of the media to adsorb over 60 percent (by weight) in organic matter.

Organoclays have been utilized as additives to permeable reactive barriers (PRB), amendments to soil liners and as a soil stabilization agent to reduce the transport of organic contaminants. The primary focus has been on the ability for this specialty sorbent to effectively adsorb low soluble organic matter from aqueous solutions. Organoclay has been also been used as an additive to soil containment barriers and low permeable slurry walls. It has been shown to reduce transport of organic contaminants and improve the hydraulic conductivity characteristics when petroleum based hydrocarbons are present. (Boldt-Leppin, Haug and Headley, 1996).

### APPLICABILITY AS A SOIL SEALANT

Sodium bentonite clay has been utilized as soil admix for hydraulic barriers for a variety of remedial applications. The primary benefit of utilizing this specialty mineral is the fact that it is very hydrophilic and swells many times (by volume) in the presence of fresh water. The result is a barrier of very low hydraulic conductivity (< 10<sup>-9</sup> m/s typical). The design of these barrier systems has focused on minimizing the flow of water. However, even with hydraulic conductivities of less than 10<sup>-7</sup> cm/s, the mass flux of many organic contaminants can be significant. While bentonite clay is able to minimize the advective flow of suspended contaminants, transport due to molecular diffusion can be a critical transport mechanism (Lake and Rowe, 2000, 2004). The inability of typical clays to impede diffusive transport has lead to new research on utilizing Organoclay and other specialty sorbents to amend standard bentonite-soil barriers. Recent studies have shown that hydraulic conductivity of sodium bentonite and earthen barriers amended with 3% (by weight) of certain types of Organoclay met or surpassed regulatory requirements of 1x10<sup>-7</sup> cm/s. More importantly, transport simulations indicated that these modified barriers can retard benzene transport. (Hunt, Smith, Burns and Rabideau, 2005).

#### APPLICABILITY IN SOIL-BENTONITE SLURRY WALLS

Slurry walls are physical barriers used to contain or direct the flow of groundwater. Most slurry walls are constructed of native soils, bentonite clay and water mixture. Portland cement and other self

> TR 828 1/2007



# REMEDIATION TECHNOLOGIES

Technical Reference

hardening components are also often used if the design requires lower permeability (< 10<sup>-7</sup> cm/s) or higher compressive strength. While these engineered barriers have long been used in construction applications to control seepage, they continue to gain popularity in remedial applications for the containment and redirection of contaminated groundwater. When constructing slurry walls, permeability is the critical parameter for designers and regulators. However, incompatibilities between traditional construction materials and site contaminants (if they are organic in nature) have lead to the development of new compositions of traditional soil-bentonite slurry walls. These new designs include specialty sorbents to more effectively contain shorter chain hydrocarbons and other organic matter that may be capable of passing through barriers with permeability as low as 10<sup>-7</sup> cm/s. When mixed in to a standard slurry wall mix at a 2% (by weight) addition rate, Organoclay has proven to effectively minimize the migration of medium to light hydrocarbons previously passing through the barrier. Furthermore, within 14 days the perm value of the amended slurry wall was almost an order of magnitude lower than the standard bentonite formulation.

#### APPLICABILITY AS A SPECIALTY GROUT

Sheet piling consists of a series of panels with interlocking connections, driven into the ground to form an impermeable barrier. These panels can be constructed from a variety of materials such as steel, vinyl and plastic depending on the site specific contaminants present. While these specialty engineered barriers have proven to be impervious to aqueous solutions and migrating organic matter, they are sometimes susceptible to these solutions passing through the interlocking joints if not installed and sealed properly. A new specialty grout incorporating Organoclay and high swelling sodium bentonite clay has proven successful in creating an impermeable seal in the open cavities within these joints. Furthermore, the addition of Organoclay to this grout ensures that organic material migrating with these solutions will not pass beyond the piling. Grouts of this type may be used to seal known areas of high infiltration or permeable formations.

## SUMMARY

Terrestrial remediation projects for organic contaminants pose many challenges for traditional technologies. Organoclay amendments to PRBs, soil liners, GCLs, slurry walls and grouts may be used to improve their performance preventing migration of these organic contaminants in both permeable and impermeable engineered barriers. Because individual site characteristics vary, project specific testing should be conducted to determine applicability.

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> TR 828 1/2007



2001 NW 19th Avenue, Suite 200 | Portland, OR 97209 | 971 544-2139 | www.maulfoster.com

November 7, 2014 Project No. 8128.01.08

Mr. Dana Bayuk Oregon Department of Environmental Quality 2020 SW 4th Avenue Portland, Oregon 97201-4987

Re: Final Revised Monitoring Wells WS-11 and WS-14 Abandonment Plan Siltronic Corporation 7200 NW Front Avenue, Portland, OR ECSI No. 183

#### Dear Dana:

On behalf of Siltronic Corporation (Siltronic), Maul Foster & Alongi, Inc. (MFA) has prepared this letter in response to direction from the Oregon Department of Environmental Quality (DEQ) to abandon nested monitoring well pairs WS-11 and WS-14 on the Siltronic property. Direction to abandon WS-14 was provided in DEQ's January 28, 2014 e-mail correspondence to Siltronic documenting a January 27, 2014 telephone conversation.

The initial version of this work plan was submitted to DEQ on February 14, 2014 to which DEQ responded in an email dated April 10, 2014. DEQ's April 10th email informed Siltronic that there were insufficient details regarding the well abandonment procedures and provided their approval to proceed with the well inspection video logging for WS-14-125/161 to support scoping and planning of the abandonment work. The video log inspection of the WS-14 monitoring well pair was submitted to DEQ on April 25, 2014. DEQ responded with comments in an email dated June 25, 2014. MFA incorporated DEQ comments and submitted a revised work plan on July 25, 2014. On September 18, 2014, DEQ responded with comments in a letter Abandonment of the WS-11 and WS-14 Monitoring Well Clusters and Installation of a Deep Monitoring Well and requested that a revised work plan be submitted to DEQ by October 6, 2014. To expedite DEQ's review, MFA provided a draft of the revised text to DEQ on October 6th prior to the final document being produced. DEQ responded in a letter on October 22<sup>nd</sup> with their approval of the final document and implementation subject to incorporating their comments. This Final Revised Monitoring Wells WS-11 and WS-14 Abandonment Plan is a revision of previous versions and incorporates DEQ's September 18th and October 22nd comments; a separate submittal will be provided addressing DEQ's September 18th request for a replacement monitoring well. For reference, DEQ correspondence is included in Attachment A.

## BACKGROUND

The nested monitoring well pairs WS-14 and WS-11 are located near the north **RECEIVED** northwest) corner of the Siltronic property as shown in the attached figure. The wells were

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completed in October 2003 (WS-11) and July 2004 (WS-14) and constructed in accordance with then-approved DEQ and Oregon Water Resources Department (OWRD) design specifications of 2-inch diameter, flush threaded, Schedule 40 polyvinyl chloride (PVC) riser pipe; and 2-inch diameter, stainless steel wire wrapped 0.010-inch slot screen; and 2-inch diameter stainless steel sump.

Monitoring well WS-11-125 was completed to 125 feet below ground surface (bgs) and monitoring well WS-11-161 was completed to 161 feet bgs, the same completion depths correlate with WS-14-125 and WS-14-161, respectively. The screened interval is 15 feet in primarily silt and sand for all four wells with a 1 foot sump at the bottom. The monitoring well construction logs are included in Attachment B.

The monitoring well pair WS-11 is identified by OWRD as well log ID "MULT 72126". For monitoring well pair WS-14, the OWRD log "MULT 73686" reports the well number as WS-13, but the reported well number appears to be incorrect. The correct OWRD well log file for WS-14 is "MULT 73686." The OWRD well logs are included in Attachment C.

Per DEQ direction in their email dated January 28, 2014, a video inspection of the inside of monitoring wells WS-14-125 and WS-14-161 was completed to identify the potential causes for the presence of manufactured gas plant (MGP) dense, non-aqueous phase liquid (DNAPL) in WS-14-161. The video logs were submitted to DEQ on April 25, 2014 for review showing the joints in the WS-14 well pair to be intact. At that time, only the WS-14 well pair was scheduled to be abandoned. In the DEQ email dated June 25, 2014, DEQ directed Siltronic to also abandon well pair WS-11-125 and WS-11-161.

# MONITORING WELL DECOMMISSIONING

Public and private utility-locating services and other information sources will be used to check for underground utilities before work begins. MFA will coordinate fieldwork to locate possible on-site utilities and piping or other subsurface obstructions. Prior to overdrilling, an air knife will be used to 10 feet bgs around the wells to verify clearance from potential subsurface obstructions. For reference, site features near WS-11 and WS-14, including known utility lines and monitoring wells, are shown on the attached figure.

The monitoring well abandonment will be conducted in accordance with applicable regulations including Oregon Administrative Record (OAR) 690-240-0510, DEQ Guidance Document titled Groundwater Monitoring Well Drilling, Construction, and Decommissioning<sup>1</sup>, and previously approved protocols for abandoning monitoring wells at the NW Natural and Siltronic sites including an OWRD variance to use bentonite or organoclay/bentonite slurry if MGP DNAPL is encountered.

The abandonment procedures will include, but not be limited to, the following:

DEQ. 1992. Groundwater Monitoring Well Drilling, Construction, and Decommissioning. Technical VED Guidance. Oregon Department of Environmental Quality. August 24.

- Measuring the depth to water and depth to bottom of the monitoring well
- Checking for the presence of MGP DNAPL and measuring its depth and thickness in each of the four monitoring wells, where present DNAPL will be removed to the maximum extent practicable before well abandonment work is initiated
- Using a sonic drilling rig, overdrilling the 2-inch-diameter PVC/steel monitoring wells to the depth necessary to confirm the removal of well construction materials:
  - o A 10-inch casing will be used from ground surface to a minimum of 5-feet below the bottom of the sand pack (approximately 130 feet bgs) at monitoring wells WS-11-125 and WS-14-125. Advancement of the 10-inch casing may continue depending on observations made in the field of the material from this depth, then
  - o An 8-inch casing will be used to remove the remaining well construction materials to the bottom of the borehole.
- The WS-14 monitoring well cluster will be overdrilled to minimum depth of 15-feet below the bottom of the filter pack for WS-14-161. The material retrieved from below the bottom of the filter pack will be visually inspected for evidence of DNAPL. If evidence of DNAPL is observed then the boring will be advanced ten additional feet and the material from the bottom of the borehole will be inspected for evidence of DNAPL. This process will be repeated until no evidence of DNAPL is observed at which time borehole sealing will proceed.
- Unless DNAPL is detected in monitoring well WS-11-161, the WS-11 monitoring
  well cluster will be overdrilled to a minimum of 5-feet below the bottom of the filter
  pack for WS-11-161 to ensure the complete removal of casing, screen, and sand from
  the borehole. In the event DNAPL is detected in WS-11-161 Siltronic will follow the
  overdrilling procedure for the WS-14 monitoring well cluster.
- Consistent with site-specific requirements for preparation and use (i.e., OWRD-approved variance), organoclay-bentonite sealant will be used throughout the depth intervals where available information (e.g., boring logs, TarGOST® logs, observations made during abandonment work) provides evidence of DNAPL occurrence.
- Use of the organoclay-bentonite mix will be documented in detail. Documentation should include but is not limited to, Siltronic providing the basis for identifying the depth interval(s) where the organoclay-bentonite sealant was used; mud-weight measurements for each volume of slurry mixed and pumped downhole; the total volume of slurry used; and the estimated depth of slurry placement.
- The remaining portions of the borehole will be sealed using materials consistent with the requirements of OAR 690-240-510
- Surface completion to match the surrounding area

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 Monitoring well construction materials, soil, decontamination liquid and groundwater generated during the well abandonment will be contained and staged on-site. Well abandonment materials will be characterized and managed consistent with the procedures established for investigation derived waste generated within the TCE Contaminated Material Management Area.

#### REPORTING

MFA will submit a report to DEQ documenting the abandonment work within 45 days of completing the fieldwork.

## **SCHEDULE**

MFA is prepared to begin work upon DEQ review and approval of the proposed approach, subject to availability of subcontractors.

Sincerely,

Maul Foster & Alongi, Inc.

Kerry-Cathlin Gallagher

Project Scientist

James G.D. Peale, RG Principal Hydrogeologist

Attachment: Figure

Attachment A—DEQ Correspondence

Attachment B-Monitoring Well Completion Logs

Attachment C-OWRD Well Logs

cc: Myron Burr, Siltronic Corporation

Alan Gladstone, Davis Rothwell Earle & Xochihua, P.C.

Ilene Gaekwad, Davis Rothwell Earle & Xochihua, P.C.

William Earle, Davis Rothwell Earle & Xochihua, P.C.

Chris Reive, Jordan Ramis

Keith Johnson, DEQ

Tom Gainer, DEQ

Henning Larsen, DEQ

Kristopher Byrd, OWRD

Sean Sheldrake, EPA

Rich Muza, EPA

Lance Peterson, CDM Smith

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Mr. Dana Bayuk November 7, 2014 Page 5 Project No. 8128.01.08

Scott Coffey, CDM Smith Bob Wyatt, NW Natural Patty Dost, Pearl Legal Group, LLC John Edwards, Anchor QEA, LLC John Renda, Anchor QEA, LLC Rob Ede, Hahn and Associates, Inc.

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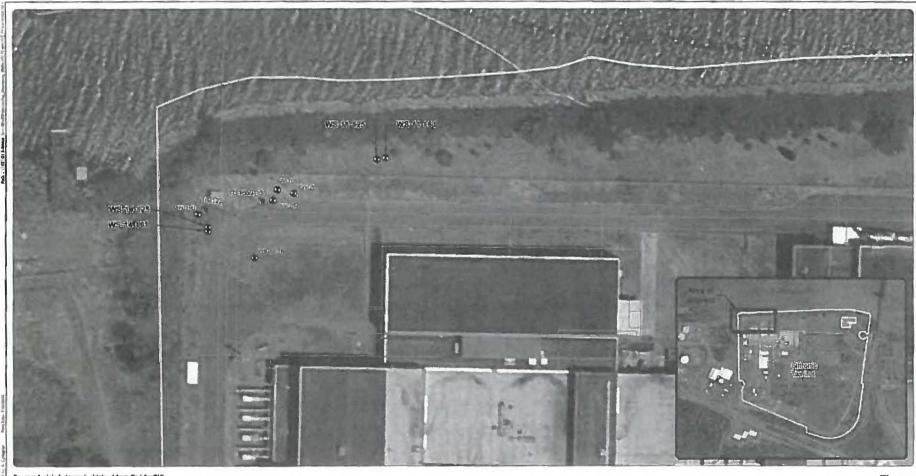
# **FIGURE**

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Source: Acriel photograph obtained from Earl ArcGIS Online.

Note: Locations are approximate and shown for reference or

2015



VED

# Legend

- NW Natural Station
- Sittronic Monitoring Well
- TarGOST Boring
- ---- Utility Line (Siltronic) Siltronic Tax Lot

Figure Monitoring Well WS-14 and WS-11 Locations

Siltronic Corporation Portland, Oregon





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# ATTACHMENT A

DEQ CORRESPONDENCE



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Department of Environmental Quality

Northwest Region Portland Office 2020 SW 4<sup>th</sup> Avenue, Suite 400 Portland, OR 97201-4987 (503) 229-5263 FAX (503) 229-6945 TTY (503) 229-5471

September 18, 2014

Also Sent Via E-mail

Mr. Myron Burr Siltronic Corporation 7200 Front Avenue, M/S 30 Portland, OR 97210-3676

Re: Abandonment of the WS-11 and WS-14 Monitoring Well Clusters and Installation of a Deep Monitoring Well Siltronic Corporation Facility Portland, Oregon ECSI No. 183

Dear Mr. Burr:

The Oregon Department of Environmental Quality (DEQ) reviewed the "Revised Monitoring Wells WS-11 and WS-14 Abandonment Plan - Siltronic Corporation, 7200 NW Front Avenue, Portland, OR – ECSI No. 183" dated July 25, 2014 (Revised Abandonment Plan). The Revised Abandonment Plan provides the approach Siltronic Corporation (Siltronic) proposes using to abandon the WS-11 and WS-14 nested double-completion monitoring well clusters. Maul Foster and Alongi, Inc. (MFA) prepared the Revised Abandonment Plan on behalf of Siltronic.

The primary purpose of this letter is to inform Siltronic that DEQ:

- Approves the Revised Abandonment Plan subject to the document being revised as indicated in this letter; and
- Requires a monitoring well to be drilled and constructed in the vicinity of the WS-11 cluster to replace the two deep installations being abandoned.

DEQ's condition for approving the Revised Abandonment Plan and additional information regarding drilling and installing the deep monitoring well are provided below.

## Abandonment of the WS-11 and WS-14 Monitoring Well Clusters

DEQ approves the Revised Abandonment Plan subject to the condition that the document be revised to include the following steps:

- In addition, to checking for the presence of dense non-aqueous phase liquid (DNAPL) and measuring its thickness in each of the four monitoring wells, where present DNAPL will be removed to the maximum extent practicable before abandonment work is initiated.
- Unless DNAPL is detected in monitoring well WS-11-161, the WS-11 monitoring well cluster will be overdrilled to a minimum of 5-feet below the bottom of the filter pack for WS-11-161 to ensure the complete removal of casing, screen, and sand from the borehole. In the event DNAPL is detected in WS-11-161 Siltronic will follow the overdrilling processing.

JAN 23 2015

Mr. Myron Burr Siltronic Corporation September 18, 2014 Page 2 of 3

the WS-14 monitoring well cluster.

- The WS-14 monitoring well cluster will be overdrilled to a minimum depth of 15-feet below the bottom of the filter pack for WS-14-161. The material retrieved from below the bottom of the filter pack will be visually inspected for evidence of DNAPL. Absent visual evidence of DNAPL, sealing of the borehole will proceed. If evidence of DNAPL is observed then the boring will be advanced ten additional feet and the material from the bottom of the borehole will be inspected for evidence of DNAPL. This process should be repeated until no evidence of DNAPL is observed at which time borehole sealing will proceed.
- Consistent with site-specific requirements for preparation and use, organoclay-bentonite sealant will be used throughout the depth intervals where available information (e.g., boring logs, TarGOST® logs, observations made during abandonment work) provides evidence of DNAPL occurrence.
- Use of the organoclay-bentonite mix will be documented in detail. Documentation should
  include but is not limited to, Siltronic providing the basis for identifying the depth interval(s)
  where the organoclay-bentonite sealant was used; mud-weight measurements for each
  volume of slurry mixed and pumped downhole; the total volume of slurry used; and the
  estimated depth of slurry placement.
- The remaining portions of the borehole should be sealed using materials consistent with the requirements of OAR 690-240-510.
- Well abandonment materials will be characterized and managed consistent with the procedures established for investigation derived waste generated within the TCE Contaminated Material Management Area.
- Siltronic will submit the report documenting abandonment work within 45-days of completing work in the field.

The Revised Abandonment Plan should be revised to include the information indicated above and submitted to DEQ on or before October 6, 2014.

## Replacement Monitoring Well Drilling and Installation

DEQ requires that Siltronic drill and install a deep monitoring well in the vicinity of the WS-11 monitoring well cluster to replace the two deep installations being abandoned. The replacement well will be used to monitor groundwater levels and chemistry in the deep Lower Alluvium WBZ beneath the "deep aquitard." The data from the installation will be used to further evaluate water level differences between the upper Lower Alluvium water-bearing zone (WBZ) and deep Lower Alluvium WBZ, and groundwater chemistry in the deep Lower Alluvium WBZ. The monitoring well will also be incorporated into Alluvium WBZ hydraulic control and containment system performance monitoring program.

The replacement monitoring well should be constructed in a separate borehole from the WS-11 double-completion installation. The replacement monitoring well should be drilled to a depth that ensures that the top of the filter pack is below the bottom of the deep aquitard. Before field work begins, Siltronic should submit a work plan for drilling and installing the monitoring well EIVED for DEQ's review and approval. The plan should include information regarding the proposed

JAN 2 3 2015

Mr. Myron Burr Siltronic Corporation September 18, 2014 Page 3 of 3

location, projected depth and basis, drilling methodology, and construction methodology and materials. DEQ requests that Siltronic submit the deep monitoring well drilling and installation plan for our review on or before October 20, 2014.

Please contact me with questions regarding this letter.

Sincerely,

## Dana Bayuk

Cc: Alan Gladstone, Davis Rothwell Earle and Xochihua Bill Earle, Davis Rothwell Earle and Xochihua Chris Reive, Jordan Ramis James Peale, MFA Kerry Gallagher, MFA Bob Wyatt, NW Natural Patty Dost, Pearl Legal Group John Edwards, Anchor QEA, LLC John Renda, Anchor QEA, LLC Rob Ede, Hahn & Associates, Inc. Sean Sheldrake, EPA Rich Muza, EPA Lance Peterson, CDM Smith Scott Coffey, CDM Smith Kris Byrd, Oregon Water Resources Department Keith Johnson, NWR/C&SA Tom Gainer, NWR/C&T Henning Larsen, NWR/C&T ECSI No. 183 File

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Department of Environmental Quality

Northwest Region Portland Office 2020 SW 4<sup>th</sup> Avenue, Suite 400 Portland, OR 97201-4987 (503) 229-5263 FAX (503) 229-6945 TTY (503) 229-5471

October 22, 2014

Also Sent Via E-mail

Mr. Myron Burr Siltronic Corporation 7200 Front Avenue, M/S 30 Portland, OR 97210-3676

Re: A

Abandonment of the WS-11 and WS-14 Monitoring Well Clusters - Siltronic Corporation

Facility

Portland, Oregon ECSI No. 183

Dear Mr. Burr:

The Oregon Department of Environmental Quality (DEQ) reviewed the "Final Revised Monitoring Wells WS-11 and WS-14 Abandonment Plan – Siltronic Corporation, 7200 NW Front Avenue, Portland, OR – ECSI 183" dated October 6, 2014 (Final Revised Abandonment Plan). The Final Revised Abandonment Plan presents the approach Siltronic will be using to abandon the WS-11 and WS-14 nested double-completion monitoring well clusters. Maul Foster and Alongi, Inc. (MFA) prepared the Final Revised Abandonment Plan for Siltronic Corporation (Siltronic) based on DEQ's September 18, 2014 comments on the Revised Abandonment Plan.

The primary purpose of this letter is to inform Siltronic that based on our review, DEO:

- Acknowledges the Final Revised Abandonment Plan has been revised consistent with our September 18<sup>th</sup> comments letter; and
- Approves the Final Revised Abandonment Plan for finalization and implementation subject to the document being revised as follows:
  - The first paragraph summarizes correspondence related to the abandonment of the WS-11 and WS-14 monitoring well clusters. The paragraph is missing a reference to DEQ's April 10, 2014 e-mail: 1) informing Siltronic that the Draft Abandonment Plan² lacked details regarding well abandonment procedures; and 2) approving video logging of the monitoring wells in the WS-14 cluster to support scoping and planning of the abandonment work.
  - The Final Revised Abandonment Plan removes references to the use of 10-inch and 8-inch casing for overdrilling the WS-11 and WS-14 monitoring well clusters. DEQ understands from telephone conversations with MFA that these casing sizes will be used. DEQ further understands that the 10-inch casing will be advanced to a minimum of 5-feet below the bottom of the sand pack at monitoring wells WS-11-125 and WS-14-125. Advancement of the 10-inch casing may continue depending on observations made in the field of the material from this

<sup>2</sup> MFA, 2014, "Monitoring Well W'S-14 Abandonment Plan, Siltronic Corporation, 7200 NW Front Avenue, For ED ECSI No. 183," February 14, a work plan prepared on behalf of Siltronic Corporation.

<sup>&</sup>lt;sup>1</sup> MFA, 2014, "Revised Monitoring Wells WS-11 and WS-14 Abandonment Plan – Siltronic Corporation, 7200 NW Front Avenue, Portland, OR – ECSI 183," July 25, a work plan prepared for Siltronic Corporation.

Myron Burr Siltronic Corporation October 22, 2014 Page 2 of 2

depth. The 8-inch casing will be used to remove well construction materials to the bottom of the borehole consistent with the procedures identified in the abandonment plan. This information should be incorporated into the Final Abandonment Plan.

DEQ requests that Siltronic incorporate the final changes indicated above and submit the Final Abandonment Plan on or before November 7, 2014.

Please don't hesitate to contact me with questions regarding this letter.

Sincerely,

Dana Bayuk Project Manager Cleanup and Site Assessment Section

Cc: Alan Gladstone, Davis Rothwell Earle and Xochihua Bill Earle, Davis Rothwell Earle and Xochihua llene Gaekwad, Davis Rothwell Earle and Xochihua Chris Reive, Jordan Ramis James Peale, MFA Kerry Gallagher, MFA Bob Wyatt, NW Natural Patty Dost, Pearl Legal Group Ben Hung, Anchor QEA, LLC John Edwards, Anchor QEA, LLC John Renda, Anchor QEA, LLC Rob Ede, Hahn & Associates, Inc. Sean Sheldrake, EPA Rich Muza, EPA Lance Peterson, CDM Smith Scott Coffey, CDM Smith Kris Byrd, Oregon Water Resources Department Keith Johnson, NWR/C&SA Tom Gainer, NWR/C&T Henning Larsen, NWR/C&T ECSI No. 183 File

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## ATTACHMENT B

MONITORING WELL COMPLETION LOGS



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Maul	Foster &	Alongi,	Inc.		t Numb 8.01.00		Wel Number WS-11	Sheet 1 of 11
Start/El Drillen/El Geolog	Name Location nd Date iquipment ist/Engineer	7200 No.	thwest o 10/3/ Corpo va	Corporation Front Avenue, P 03 ration/Rotosonic			TOC Elevation (feet NGVD)	31.8500
	Well	1		Samole Deta			Soil Description	
Depth (feet, BGS)	Details	Interval Percent	Coffection	Neme (Type	Blows/6	Lithologic Column		
1 2 00		100	% CB	PID = 0.6	,		0.0 to 0.5 feet: TOPSOIL, GRAVELLY SILT (ML) non plastic; 30% gravel, medium, subangular, rootlets, woody debris; moist 0.5 to 1.5 feet: SANDY GRAVEL (GP); brownish	50% organic debris, gray; 40% sand, fine to ounded: dry. (Fill)
3 00 00 00 00 00 4 00 00		100	% св	PID = 0.0			<b>,</b> ,	
- B	00 00	700	, CB					
2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				PID = 0.0				
8		100	% CB				7.0 to 12.0 feet: SAND (SP); dark brown; 100% s fines and gravels; moist. (Fill)	and, fine to medium; trace
. 9				PID = 0.6			t	
10				PID = 0.0				
12 13	1 1001 1001			PID = 0.0			12.0 to 16.0 feet: WOOD; core of wood; staining naphthalene or petroleum like odor. (Fill)	at upper end of wood;
14								
15				PID = 0.0				
17		100	% CB				16.0 to 17.0 feet SAND (SP); dark brown; 100% fines and gravels; moist. Possibly drilling slut the hole from the wood. (Fit) 17.0 to 18.0 feet. WOOD; core of wood; staining naphthalene or petroleum like odor. (Fit)	f from trying to dean out
18		100	% СВ	PID = 0.0		34-51	18.0 to 19.0 feet SAND (SP); light brown, moist, 1 trace fines and gravels; moist. (Fill)	
20				PID = 0.0	,		19.0 to 21.0 feet: SANDY SILT (ML-SM); light gr 50% sand, fine to medium; dry. Brittle, break	ay; 50% fines, non plastic; s apart in flakes. (Fill)
NOTES:				2. PID = Photo ionization surface. 5. PVC = poly			reading in parts per million. 3. GW = groundweter sample, dashe	A M MAN WATER TO
	oproximate v					v.= <del>5</del> 5.)		JAN 23

Depth (feet, BGS)		I Foster & Alongi, Inc.					8128.	Numbe 01.06		Well Number WS-11	Sheet 2 of 11
Depth (feet, B(	Details law August 1990				<sub>5</sub> S	ample			T	Soil Description	20111
		Details	Interval	Percant Recovery	Collection Method c	Number	Name (Type)	Blows/8	Lithologic Column		
21		7					PID = 0.0			21.0 to 270 feet: SAND (SP); reddish-brow gravel, fine to medium, subrounded; dr	un; 90% sand, fine to medium; 10% y to moist. (Fill)
23							PID = 0.0 PID = 0.0			@ 22.5 feet: 0.2-foot layer color change to steel shackle from a padlock.	o light gray. Steel debris, possibly
24 25							PID = 0.0				
<i>2</i> 6				,							
27			ŀ	90%	CB		PID = 0.0			27.0 to 28.0 feet. NO RECOVERY.	
28 29		Z	立							28.0 to 31 5 feet SAND (SP); dark gray; 9: gravels, subrounded; wet. (Fill)	5% sand, line to medium; 5%
30							PID = 0.0				
31 32										31.5 to 370 feet: SILTY SAND to SANDY fines, non plastic; 50% sand, fine; org	SILT (SM-WL); dark gray, 50%
33							PID = 13.5			@ 31.5 feet 0.2-foot thick layer of staining	
34							PID = 7.0				
30	201 E	106 1001					PID = 0.0				
37				90%	СВ		PID = 0.0			37.0 to 38.0 feet. NO RECOVERY.	
38							7.5 - 0.0		अस्यक्ष	38.0 to 41.0 feet: SANDY SILT (ML); dark	gray, 60% fines, non plastic, 40%
39										sand, fine; organic debris, wood, roots	s; wet
40							PID = 0.0				
41 42										41.0 to 470 feet: SILTY SAND (SM); dark sand, fine to medium, organic debris, r petroleum-like odor;	
	88 1	00 100		ample and a	make 0	DIO	Charles front of the		BASS	morting in node parallels 2 CM/	RECEIV
NOTE							Photo ionization di 5. PVC = poly vin			seding in parts per million. 3. GW = ground-valer samp	le, deshed graphic indicates approximate  JAN 23 7

WATER RESOURCES DEPT SALEM, OREGON

N/la:	ul Foster & A	Mon	nai I	nc		Electrical I			Borehole Log/Well Const	truction Sheet
vial	ai rosterot A	AIUI.	ıyı, II	IU.		Project / 8128.0			WS-11	Sheet 3 of 11
BGS)	Well Details		- 2	§ S	ample l	Data	1 10	4	Soil Description	
(feet, E		Interval	Percent Recovery	Collection	Number	Name (Type)	Blows/6	Lithologic Column		
15	100 100 100	=	0.00	0.2	<		-	70		
43						a)				
44							,			
<b>4</b> 5						PID = 0.0				
46										
_										
4/			100%	СВ		PID = 0.0			47.0 to 50.0 feet SILTY SAND (SM); dark	gray, 40% fines, non plastic; 60
48									sand, fine to medium; micaceous; orga	nic debris; wet.
49										
10										
50						PID = 0.0			50.0 to 53.5 feet. SAND with SILT (SP-SN	fl: derk aray 1596 fines man
51									plastic; 85% sand, fine to medium; mic	aceous; wet
		B					-81			
52		8				PID = 0.0				
53										
					^	PID = 0.0			53.5 to 54.0 feet: SILT (Mt.); dark gray; 95	V fines how to medium plasticity
54						P1D = 0.0		338.338	5% sand, fine; sand in pockets; micao 54.0 to 57.0 feet: SAND with SILT (SP-SN	eous: organic debris.
55						,			plastic; 85% sand, fine to medium; mic	
56		ă.								
57		-	100%	CB		PID = 0.0			57.0 to 58.0 feet: SILTY SAND (SM); dark	corev 20% fines non plastic: RC
58	1991 1991 1991					PID = 0.0			sand, fine to medium; micaceous; orga	nic debris; wet
						PID = 0.0			58.0 to 59.0 feet: SILT (ML); dark gray; 10 fine sand in pockets; micaceous; orga	00% fines, medium plasticity, trac nic debris, roots; wet.
59						-ID = 0.0		\$25858 1111111111111111111111111111111111	59.0 to 60.0 feet SAND with SILT (SP-SN	f); dark gray; 15% fines, non
60									plastic; 85% send, fine to medium; mic	aceous; wet.
64						PID = 0.0			60.0 to 64.0 feet: SILTY SAND (SM); dark sand, fine to medium, micaceous; orge	: gray; 20% fines, non plastic; 80; inic debris; wet.
51										
62			1000	СВ						
63			100%	UB		PID = 0.0				
						PID = 0.0				
64									64.0 to 67.0 feet: SAND (SP); dark gray; 5	% fines, non plastic: 95% sand
65	MOVE NOVE NOVE								fine to medium; micaceous, coarse mic	o fakes VRECEIVE
OTE	ES: 1. CB = 4x6-inch	oore bar	nel soll sa	mpler, 2	. PID=F	Photo ionization de	dector, s	soil head space i	reading in parts per million. 3. GW = groundwater samp	le, dashed graphic indicates approximate
						i rv∪=palyvinj	yi c <b>tiior</b> k	Jes.		JAN 23 ZUI
$\nabla$	Approximate wa prior to well dev			serve	d					WATER RESOURCES

Mau	Il Foster & A	Alongi, Ir	1C.		Project N 8128.0	lumbe		Borehole Log/Well Consti	Sheet 4 of 11
(S)	Well	T	_ S	ample Dal				Soil Description	7 0
(feet, BGS)	Details	Interval Percent Recovery	Coffection	Number	Name (Typs)	Blows/6	Lithologic Column		
66				F	PID = 0.0				
67		100%	СВ	F	PID = 0.0			67.0 to 67.5 feet. NO RECOVERY; stuff.	
68				F	PID = 0.0			67.5 to 72.0 feet: SAND (SP); dark gray, 57 fine; micaceous; organic debris, roots; r	6 fines, non plastic; 95% sand, noist to wet.
70			GW	100	611-W-72.0 PID = 0.0	)		@ 70.0 feet: 0.2-foot layer of silt with organ	uic debris.
72		######################################	СВ	F	PID = 0.0			72.0 to 75.0 feet. NO RECOVERY; stuff.	
73									
74									
75 76								75.0 to 78.0 feet: SILTY SAND (SM); dark sand, fine to medium; micaceous; wet	gray; 20% fines, non plastic; 80
77									
78 79				F	PID = 0.0			78.0 to 82.0 feet: SAND (SP); dark gray; 55, fine; micaceous; wet	% fines, non plastic; 95% sand
00	6554 6554 655			F	PID = 0.0				,
82					PID = 0.0			820 to 83.0 feet: SILT (ML); dark gray; 95	& fines non plastic 5% sand
83								fine, sand in pockets; micaceous; organ 83.0 to 84.0 feet: SAND (SP); dark gray; 5!	nic debris, roots; moist
84								fine; micaceous; organic debris; wet. 84.0 to 85.5 feet: SILTY SAND (SM); dark sand, fine to madium; micaceous; wet.	gray; 20% fines, non plastic; 8
85 86		10 160 H 600 GI	GW		611-W-87.0 PID = 0.0	)		85.5 to 86.0 feet: SiLT (ML); dark gray; 85.	
87								fine, sand in pockets: misaceous: mois 86.0 to 87.0 feet SAND (SP); dark gray; 5! fine; 5% organic debris, woody debris;	% fines, non plastic; 90% sand micaceous; wet.
		100%			PID = 0.0			87.0 to 87.5 feet: SAND (SP); dark gray, 5	The Cartest Ca
IOTE	S: 1. CB = 4x6-inch screened interval.  Approximate wa	4. bgs = below	giound s	urface. 5. F				reading in paris per milion. 3. GW = groundweter sample	, dashed graphic indicates approximate ${\sf JAN}23201$

WATER REGOURCES DEPT SALEM, OREGON

Mau	il Fos	ster & A	Nor	ngi, lı	nc.		Project N 8128.0		r	Well Number W/S-11	Sheet 5 of 11
S		Well	T		_ S	ample i		77.00		Soil Description	<del></del>
Depth (feet, BGS)	- 1	Details	Interval	Percent Recovery	Collection	Number	Name (Type)	Blows/6"	Lithologic Column		
88 89							PID = 0.0			l fine; micaceous; wet. 87.5 to 88.0 feet: SILT with SAND (ML) 30% sand, fine to medium; micaceo 88.0 to 92.5 feet: SAND (SP); dark gray fine; micaceous; wet.	); dark gray; 70% fines, non plastic; sus: organic datris; moist to wet. r; 5% fines, non plastic; 95% sand,
90							PID = 0.0				
91											
92 93										92.5 to 94.5 feet. SILT (ML); dark grey;	90% fines, medium plesticity: 10%
94										sand, fine to medium, sand in pocke	ets; micaceous; organic debris; wet
95							PID = 1.5			94.5 to 98.0 feet SAND (SP); dark gray fins; micaceous; wet.	r, 5% fines, non plastic; 95% sand,
96							. 13 - 110				
97							PID = 1.5				
98 99										98.0 to 102.0 feet: SAND with SILT (SF plastic; 85% sand, fine to medium; i noclules, up to 0.5-inches in diamete	micaceous; wet. Fines occur in
100			nini		GW	V	VS11-W-102 PID = 4.5	0			
101 102			MIR MIR MIR MIR MIR III				FID ~ 4.3				
				100%	СВ		PID = 13.6		L1	102.0 to 107.0 feet: SAND (SP); dark g fine to medium, red and green lithic:	ray; 5% fines, non plastic; 95% sen s; micaceous; wet
104							PID = 0.0				
105				4			PID = 0.0			@ 105.0 feet 0.2-foot layer of SILT (Mi	L); dark gray; 90% lines, 10% sand
106									h)hin)	fine, sand in pockets; wet.  @ 105.5 feet 0.2-foot layer of SILT (Milline, sand in pockets; wet.	L); dark gray; 90% fines, 10% sand
107				90%	СВ		PID = 0.0			107.0 to 108.0 feet. NO RECOVERY,	
109							PID = 3.0			108.0 to 112.0 feet: SILT (ML); dark gra to medium plasticity; micaceous; or	
										Visible sheen on water in soil core bag.	
110	<u>: 日:</u>										RECEIVE
	S078		4. bgs	= balow	ground s	urface.	Photo ionization de 5. PVC = poly ving			reading in parts per million. 3. GW = groundwalter sa	uriple, dashed graphic indicates approximate JAN 23 20

Ma	ul Foster & A	Alor	ngi, l	nc.		Project N 8128.0	kımbe	N.	Borehole Log/Well Construction  Well Number Sheet WS-11 6 of 11	
S	Well.		_	_ s	ample i		1.06		Soil Description	_
Depth (feet, BGS)	Details	Interval	Percent Recovery	Collection Method c	Number	Name (Typs)	Blows/6"	Lithologic Column		
						PID = 3.1				
111										
112										_
113									112.0 to 118.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% s fine to medium, red and green lithics; micaceous; wet.	an
113						PID = 0.0				
114			1							
115										
440		439 H 101 H 611 H		GW		VS11-W-117 WS11-W-DUP	0			
116		HHHH				PID = 3.1		itingti	@ 116.0 feet: 0.1-foot layer of SILT (ML).	
117		Sm mm	100%	СВ		PID = 3.1				
118	围		10075			PID = 3,1				
440						PID = 6.2			118.0 to 118.5 feet: SILTY SAND (SM); dark gray; 20% fines, non plast 80% sand, fine to medium; wet.	C,
119									Strong odor, visible sheen on soil. 118.5 to 119.5 feet: SiLT (ML); dark gray; 95% fines, low to medium	-
120						PID = 0.0			plesticity. 5% send fine to medium; wet. Faint odor	an
121		1				FID = 0.0			119.7 to 120.0 feet SILT (ML); dark gray; 95% fines, low to medium plasticity, 5% sand, fine to medium; micaceous; wet	_
									120.0 to 122.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% s fine to medium, red and green lithics; micaceous; wet.	an
122									122.0 to 123.0 feet: SILT (ML); dark gray; 95% fines, low to medium	-
123						PID = 0.0			plasticity; 5% sand, fine to medium; micaceous; wet.  123.0 to 127.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% s	
124						F15 = 0.0			fine to medium, red and green lithics; micaceous; wet.	<i>a</i>
		N								
125	ICUCAL IIC COOO CO					PID = 0.0				
126	00000 00 00000 00 000000 00									
127										
	######################################		100%	CB		PID ≈ 0.0			127.0 to 128.0 feet: SILTY SAND (SM); dark gray, 20% fines, non plast 80% sand, fine to medium, red and green lithics; wet.	ic;
128								417	128.0 to 132.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% s	an
129									fine to medium, red and green lithics; micaceous; wet.	
130										
		пинини		GW	V	VS11-W-132 PID = 0.0	0	iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii	@ 130.0 feet: 0.3-foot layer of SILT (ML); dark gray, organic debris.	
131		THEFT								
132		Name of the last	100%	CB				adden en sele.	132.0 to 137.0 feet: SANID (SP); dark gray with white speckles, salt and	1
NOTI	FS: 1 CP - 448 train	ne he			DID-1	PID = 0.0	brev -	A bood one	reading in parts per milion. 3. GW = groundweler sample, deshed graphic indigendary	40
14011	screened interval	4. bgs	= balow	ground s	urface. t	5. PVC = poly viny	i chloric	ta.	or iii · · ·	
$\nabla$	Approximate wa prior to well deve			serve	d				WATER RESO	

Maı	ul Foster & /	Alor	ngi, li	nc.		Project N 8128.0			Well Number WS-11	Sheet 7 of 11
(S)	Well	T		_ S	ample i		77.00		Soil Description	7 07 11
Depth (feet, BGS)	Details	Interval	Percent Recovery	Collection	Number	Name (Type)	Błows/6"	Lithologic Column		
133						PID = 0.0			pepper look; 5% fines, non plastic; wet.	95% sand, medium; micaceou
135 136	(CCD-2) (BC-1) (	The Parket				PID = 0.0				
137										
138			70%	CB		PID = 0.0			137.0 to 140. <b>0 feet. NO</b> RECOV <b>ER</b> Y.	
39										4
40 41	50505 5d 10000 110					PID = 0.0			140.0 to 146.5 feet: SAND (SP); dark grey pepper look; 5% fines, non plastic; 95% red lithics; micaceous; wet.	
<b>4</b> 2										
43						PID = 0.0				
44 45 46		un mummumumumumumumumumumumumumumumumumu		GW	V	VS11-W-147. PID = 0.0	o			
47 48		nanna	100%	СВ	×	PID = 0.0			148.5 to 147.0 feet: SILT (ML); dark gray, plesticity: 5% sand line to medium, se 147.0 to 150.0 feet: SAND (SP); dark gray medium, dark green and red lithics; mic	nd in pockets: miceosous: wet r, 5% fines, non plastic; 95% sa
49						PID = 0.0				
50 51					w.	PID = 0.0			150.0 to 152.0 feet: SILT with SAND (ML) medium plasticity, 30% sand, fine to m organic debris; wet.	
52									152.0 to 153.0 feet: SAND (SP); dark gray	
53						PID = 0.0			medium, dark green and red lithics; mi 153.0 to 153.5 feet: SILT with SAND (ML, medium plasticity; 30% sand, fine to m	; dark gray; 70% fines, low to
54 55									organic debris; wet 153.5 to 157 feet: SAND with SILT (SP-SI plastic; 85% sand, fine to medium, rec wet. Fines occur in chunks or balls.	M); dark gray; 15% lines, non and green library grayin det RECEIVED
ЮТЕ						Photo lanization de 5. PVC = paly vin			reading in parts per million. 3. GW = groundweter samp	

									c Borehole Log/Well Construction	
Mau	ul Foster & A	Along	gi, Ir	nc.		Project / 8128.0			Well Number WS-11	Sheet 8 of 11
Depth (feet, BGS)	Well Details	Interval	Percent	Collection Method	Number Number	Deta Name (Typa)	Blows/6"	Lithologic Column	Soil Descriptio	n
	- 88885≣81					PID = 0.0		2023.83.8		
156 157 158		- 1	100%	СВ		PID = 0.0			√ <u>(0, 157.0 feet 0.2-foot layer of SILT (ML</u> 157.2 to 160.0 feet: SAND (SP); dark g pepper look; 5% fines, non plastic; 9.	.). ray with white speckles, salt and 5% sand, medium, green and red
159						ı			lithics; wet.	
160						PID = 0.0			160.0 to 161.0 feet. SILT with SAND (N medium plasticity, 30% sand, fine to	medium; wet
162									161.0 to 164.0 feet SAND (SP); dark g pepper look; 5% fines, non plastic; 9: lithics; wet. @162.0 feet 0.3-foot layer of SILT (ML,	5% sand, medium, green and red
163 164	\$\tan\$\tan\$\tan\$\tan\$\tan\$\tan\$\tan\$\tan					PID = 0.0			@1628 feet 0.3-foot leyer of SILT (ML)	
165	10101010101 010101010101 101010101010 10101010101 10101010101			GW	V	VS11-W-167.	0		164.0 to 165.0 feet: SILT (ML); dark gre medium plasticity; 10% sand, line, s 165.0 to 165.5 feet: SANDY SILT (ML);	and in pockets, organic debris; w
166 167	00000000000000000000000000000000000000	THE THE PERSON IN				PID = 0.0			fines_pon plastic: 40% sand, fine. 165.5 to 167.0 feet: SAND (SP); dark g pepper look; 5% fines, non plastic; 9 lithics; wet	vet: ray with white speckles, salt and 5% sand, medium, green and red
168			80%	CB		PID = 0.0			167.0 to 169.0 feet NO RECOVERY.	
169 170						PID = 0.0			169.0 to 170.5 feet SAND (SP); dark g pepper look; 5% fines, non plastic; s wet	95% sand, fine, green and red lith
171 172	TOTOTOTO TOTOTOTO TOTOTOTO TOTOTOTO TOTOTOTO								171.0 to 1714.0 feet. SLIVE SAND (SN), 6 80% sand, fine; wet. 171.0 to 174.0 feet. SAND (SP); dark g fine to medium, dark green and red	ray; 5% fines, non plastic; 95% se
173 174	######################################					PID = 0.0				
175 176	gagagaga gagagaga gagagaga gagagaga gagagaga gagagaga gagagaga gagagaga gagagaga					PID = 0.0			174.0 to 174.5 feet: SiLT (IVIL); dark gra- medium plasticity. 10% sand, fire, s 174.5 to 179.0 feet: SAND (SP); dark g pepper look; 5% fines, non plastic; 9 red lithics; wet.	and in pockets: wet
177	0,00,00,00 0,00,00 0,00,00 0,00,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,0	- 1	00%	СВ		PID = 0.0				
NOTE	S: 1. CB = 4x6-inch c	ore barre	el soil se	mpler. 2	PID=I	Photo ionization de 5. PVC = poly viri	Mactor, s	oil head space	reading in parts per million. 3. GW = groundwalks	Colored Valencing cates approximate

WATER RESOURCES DEPT SALEM, OREGON

Ma	ul Foster &	Alor	ngi, I	nc.		Project I	Numbe	er .	Borehole Log/Well Co	Sheet
_	1468					8128.	01.06	1	WS-11	9 of 11
Depth (feet, BGS)	Well Details	Tip.	not year	N R	ample	Deta 	1 8	300	Soil Descrip	agon .
Dept (feet,		Interval	Percent Recovery	Collection	Number	Name (Type)	Blows/6	Lithologic Column		
	00000000							277724		
178						PID = 0.0				
179										
	00000000								179.0 to 182.0 feet: SAND (SP); dark	gray with white speckles, salt and
180	00000000								рвррег юок, 100% sand, төсшт,	, green and red linics; wet
		# H		GW		VS11-W-182 PID = 0.0	0			
181	00000000									
82	00000000									
-		3	100%	CB		PID = 0.0		++++	182.0 to 187.0 feet SAND (SP); dark	gray, 5% fines, non plastic; 95% sen
83									fine, red lithics; wet.	
						PID = 0.0				
184							ĺ			
85										
ω						PID = 0.0				
86	000000000 00000000									
87		-	90%	СВ					187.0 to 188.0 feet. NO RECOVERY.	
00	00000000		3076	CB		PID = 0.0			107.0 ED 100.0 ROEL INC RECOVERT.	
88								2000	188.0 to 195.0 feet: SAND (SP); dark	gray; 5% fines, non plastic; 95% sar
89									fine, red lithics; wet.	
	00000000									
90	000000000					PID ≈ 0.0				
04	00000000					PID = 0.0				
91										
92										
	0000000000 000000000000000000000000000									
93						815 - 0.0				
0.4						PID = 0.0				
94	000000000			1				1,14		
95										
		an ag		GW	V	VS11-W-197 PID = 0.0	0		195.0 to 195.5 feet. SILT (ML); dark of	gray to greenish-gray; 95% fines, low pockets; organic debris, roots, leave
96		四日與日間和四月日日				FID = 0.0			wet.	The production of the contract of the production
-		# H							195.5 to 201.0 feet. SAND (SP); dark fine to medium, red lithics; wet.	r gray, 5% tines, non plastic; 95% san
97			40%	СВ		PID = 0.0				
98			. = / 4			-ID - 0.0				
50	DODODODO									
99	00000000 000000000									
										DEACHIER
200	DODO DO DOL							3116311		RECEIVED
IOT	TES: 1, CB = 4x6-inch screened interval.	core be 4. bgs	rrel soil se i ≃ below	ampler. 2 grounds	PID = I	Photo ionization di 5. PVC = poly vin	elector, s yl chloric	soil head space i de.	eading in peris per million. 3. GW = groundwater.	Semple, dashed graphic indicates approximate JAN 23 2015
$\nabla$	Approximate wa			serve	d					WATER RESOURCES D
	PITOL TO MEN OCA	John								SALEM OREGON

WATER RESOURCES D SALEM, OREGON

		670				G	eologic	Borehole Log/Well Cor	nstruction	
ıl Foster &	IOIA	ngi, Ir	nc.				7	Well Number WS-11	Sheet 10 of 11	
Well			<sub>-</sub> S	Sample Data				Soil Description		
Details	Interval	Percent Recovery	Collection	Number	Name (Type)	Blows/6"	Lithologic Column			
					PID = 0.0			2010 to 2015 \$-1 \$1 TV CRAVE V	CAR dead own 450/ form and along	
0    0    0    0    0    0    0					PID = 0.0		000000000000000000000000000000000000000	85% gravel, fine to coarse, subrout	aw, cark gray, 13% mes, non passionded to rounded; wet.	
	THE HEAD IN CO.		GW		WS11-206.0			204.5 to 207.0 feet. BASALT; light gra	y to dark gray, moist to wet, bedrock	
DIOTOTOLO DIOTOTOLO DIOTOTOLO DIOTOTOLO DIOTOTOLO DIOTOTOLO DIOTOTOLO	Hamman							(Columbia River Besalt Group) Sig hardness.	gnificent increase in resistance, drilling	
	Wei Details  Details	Weil  Details  Zerials  Details  Zerials  Details  Zerials  Details  Zerials  Details  Detail	Well  Details  Jean State of the state of th	Delails  Del	Weil Details   Sample   Sample   Details   Det	### ### ##############################	Foster & Alongi, Inc.	Foster & Alongi, Inc.   Project Number 8128.01.06	### Semple Data    Semple Data	

#### WS11 Completion Details

Oregon Water Resources Department Well Start Card Number: W147655 Oregon Water Resources Department Well Identification Number: L67076

#### **Boring**

- 0.0 to 58.0 feet bgs: 9-inch temporary, threaded steel, isolation casing. 0.0 to 137.0 feet bgs: 8-inch temporary, threaded steel, isolation casing. 0.0 to 58.0 feet bgs: 7-inch temporary, threaded steel, isolation casing. 0.0 to 207.0 feet bgs: 6-inch temporary, threaded steel, isolation casing.
- 0.0 to 207.0 feet bgs: 4x6-inch core barrel sampler.
- 0.0 to 1.5 feet bgs: flush mount vault and cement seal, 1.5 to 5.0 feet bgs: 3/8-inch Baroid bentonite chips hydrated with potable
- 5.0 to 102.0 feet bgs: bentonite grout sturry, 10.0 pounds per gallon.
  102.0 to 104.0 feet bgs: non-ecetone coated, 3/8-inch bentonite chips hydrated with potable water.
- 104.0 to 106.0 feet bgs: 20x40 washed Colorado silica sand, secondary filter
- pack. 106.0 to 124.0 feet bgs: 10x20 washed Colorado silica sand, primary filter
- pack. 124.0 to 126.0 feet bgs: non-acetone coated, 3/8-inch bentonite chips hydrated with potable water.
- 126.0 to 139.0 feet bgs: bentonite grout slurry, 10.3 pounds per gallon. 139.0 to 140.0 feet bgs: non-acetone coated, 3/8-inch bentonite chips hydrated with potable water.
- 140.0 to 142.0 feet bgs: 20x40 washed Colorado silica sand, secondary filter pack.
- 142.0 to 161.0 feet bgs: 10x20 washed Colorado silica sand, primary filter pack.
- 161.0 to 207.0 feet bgs: non-acetone coated, 3/6-inch bentonite chips hydrated with potable water.

Well WS11-125: 0.0 to 109.0 feet bgs: 2-inch diarneler, schedule 40 PVC blank riser pipe. 109.0 to 124.0 feet bgs: 2-inch diarneter, stalnless steel wire wrapped screen, 0.010-slot.

124.0 to 125.0 feet bgs: 2-inch diameter, stabless steel sump.

NOTES: 1 C8 = 4x6-inch core barrel soil sampler, 2 PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. JAN 23 2015

Approximate water level observed prior to well development.

WATER RESOURCES DEPT

SALEM OFFICE

WYGINTIGINTWPROJECTS/8128-01/WS10-13.GPJ 7/2/04

GBLWC

				Geologic	Borehole Log/Well Con	struction
Mau	l Foster &	Alongi, inc.	Project Nu. 8128.01		Weil Number WS-11	Sheet 11 of 11
Depth (feet, BGS)	Well Details	Interval Percent Recovery Collection Method	Sample Data	Blows/6" Lithologic Column	Soll Descriptio	n

Well WS11-161:
0.0 to 145.0 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe.
145.0 to 160.0 feet bgs: 2-inch diameter, stainless steel wire wrapped screen, 0.010-slot.
160.0 to 161.0 feet bgs: 2-inch diameter, stainless steel sump.

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CB = 4x6-inch core benrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened intervel. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.

JAN 23 2015

Approximate water level observed prior to well development.

WATER RESOURCES DEPT SALEM, CREGON

GBLWC W/GINT/GINT/WPROJECTS/8128-01/WS10-13.GPJ 7/2/04

Mau	l Foster &	Alongi,	inc.	Project			Well Number	Sheet	
Proje Start Drille Geok	act Name act Location /End Date ar/Equipment logist/Engineer ple Method	Sittronic ( 7200 NW 6/22/2004 Boart Lon ABC/EB 4x6-inch (	Front Av to 7/9/2 gyear/R	ion renue Portland, Ore 004 otosonic	01.08 egon	-	WS-14  TOC Elevation (feet) Surface Elevation (feet) Northing Easting Hole Depth Outer Hole Diam	1 of 11 32.4 705183.4 7624486.1 210.0-feet 10.0 to 6.0-	
Depth (feet, BGS)	Well Details	Interval Percent Recovery	Callection Method co	ample Data	Blows/6" Lithologic	Column	Soil Description		
(feet		Interval Percent	Coll	Name (Type)	Blow	Cole			
_ 1		100	СВ			0	0.0 to 1.3 feet: GRAVELLY SILT (ML); dark ye non plastic; 30% gravels, fine, subangula	r, trace organic debris; dry.	
3				PID = Oppm			1.3 to 10.0 feet: SiLTY SAND (SM); dark gray 50-60% sand, fine; damp.	; 40-50% fines, low plasticity	
. 4		80%	CB				© 5 0 feets to amount Energie 500/		
6		95%	СВ	PID = 0ppm.			@ 5.0-feet Increased fines to 50%.		
. 7 _ 8 _ 9				PID = 0ppm					
10							@ 9.5-feet: slight odor.  10.0 to 11.0 feet: SAND (SP); light grayish-bro	nun: 10094 sand fine: trace	
11							fines; no noticeable odor, damp.	, 10070 aero, mic, udoc	
		100	CB				11.0 to 14.0 feet: SAND (SP); light grayish-bro fines; trace gravels, fine to coarse; trace of tarr-like balls; damp.	own; 100% sand, fine; trace organic debris; slight odor;	
13				PID = Oppm.					
. 15							14.0 to 16.0 feet. SAND (SP); light grayish-bro fines; trace organic debris; no noticeable	own; 100% sand, fine; trace odor; damp.	
16		100	СВ	PID = Oppm	• 6		16.0 to 18.5 feet: GRAVELLY SAND (SP); tig fine; 30% gravels, fine to medium, suban		
. 17 . 18					.0	O.			
19				PID = 0ppm			18.5 to 22.0 feet: SAND (SP); dark yellowish- trace fines, non plastic; damp.	brown; 100% sand, fine;	
20								- Cand V E	
16 17 18 19 20 NOTES	S: 1. CB = 4x6-li indicates appr	nch core barre oximate scree	l soil sam ned interv	pler. 2. PID = Photo it ral. 4. bgs = below gro	onization delec- ound surface.	tor, soil 5. PVC	I head space reading in parts per million. 3. GW = gr C = poly vinyl chloride. 6. Odor characteristic of manu.	ound A Names, Desharp 15	

/laul	Foster & A	Alon	ıgi, l	inc.		Project N 8128.0	lumbe		Borehole Log/Well Construction  Well Number Sheet WS-14 2 of 11
(SE	Well		. >	, § Se	ample			ą.	Soil Description
(feet, BGS)	Details	Interval	Percent Recovery	Coffection	Number	Name (Type)	Blaws/6	Lithologic Column	
21 22 23 24 25 26 27 28 29 30 31 32 33 34			100	СВ					
22			e 50€0			DVD - O			
23						PID = Oppm.		ШШШ	22.0 to 22.5 feet: SILT (ML); light brownish-gray, 85% fines, low plastic 15% sand, fine; trace gravels, fine to medium, subrounded; trace organic debris; trace woody debris; damp.
. 8		-	100	СВ				e y Pie	22.5 to 23.5 feet: SAND (SP); dark yellowish-brown; 100% sand, fine; trace fines, non plastic; damp.
24 88									23.5 to 26.0 feet: GRAVELLY SILT (ML); light grayish-brown; 65% fine medium plasticity; 35% gravels, fine to coarse, subangular, trace sand; moist.
5						PID = Oppm.			
6		-	100	СВ					26.0 to 29.0 feet: GRAVELLY SILT (ML); dark brownish-gray; 65% fine
7									medium plasticity; 35% gravels, fine to coarse, subangular, trace sand; strong sheen and odor; possible product; moist.
8									
9					F	1D = 29.7ppm			
									29.0 to 33.0 feet: SANDY SILT (ML); dark brownish gray, 65% fines, lo plasticity, 35% sand, fine; heavy sheen and odor, tarry-like impact
0									possible product; moist.
1		-	100	СВ		PID = 8.1ppm			
2									
з						DID. A			
4						PID ≃ Oppm.			33.0 to 35.0 feet: SILTY SAND (SM); dark grayish-brown; 40% fines, lo plasticity; 60% sand, fine; subrounded clast approximately 5-inche diameter; heavy sheen and odor; moist.
, <b>.</b>									
5						PID = Oppm.			35.0 to 35.5 feet: SAND (SP); light yellowish-brown; 100% sand, fine; t fines, non plastic; heavy sheen and odor; moist.
66 17 18 19 10			90	СВ					35.5 to 38.5 feet: SAND (SP); dark brownish-gray; 100% sand, fine; tra fines, non plastic; heavy sheen and odor; globules; moist to wet.
7									
8						PID = Oppm.			
9						ruo – opprit			38.5 to 52.5 feet: SILTY SAND (SM); dark brownish-gray; 25% fines, n to low plasticity; 75% sand, fine; trace gravels, subangular, strong
o 💸									odor, wet.
888									
1			100	CB		PID = 8ppm.			
2									RECEIVED
OTES:	1. CB = 4x8-inc indicates approx	ch core i	barrel s	oil samp	oler. 2. al. 4. l	PID = Photo ioi bgs = below grou	nization and sur	n detector, sol	il head space reading in parts per million. 3. GW = groundwater Sample, da had ce poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.
									WATER RESOURCES

Maul	Foster &	Alon	gi, I	Inc.		Project N 8128.0	lumbe	er	Borehole Log/Well Cor Well Number WS-14	Sheet 3 of 11
Depth (feet, BGS)	Well Details	Interval	Percent	Collection Method go	Namber dame		Blows/6"	Lithologic Column	Soil Description	
43		Ī								
44						PID = Oppm.				
<b>4</b> 5										
46										
47 48						PID = Oppm.				
49										
50						PID = 0ppm.				
51										
52 53									52.5 to 53.0 feet: SILT (ML); dark brow	nish-gray; 90% fines, low plastic
54 S						PID = 0ppm.			10% sand, fine; strong odor, moist 53.0 to 55.5 feet: SILTY SAND (SM); o to low plasticity; 75% sand, fine; tre odor, wet.	to wet. tark brownish-gray; 25% fines, no ace gravels, subangular, strong
55									oon, not	
56 57		-	100	СВ		PID = Oppm.			55.5 to 56.0 feet: SILT (ML); dark brow 10% sand, fine; strong odor, moist 56.0 to 58.0 feet: SAND WITH SILT (S fines, non plastic; 85% sand, fine;	to wet. P-SM); dark brownish-gray: 15%
K										
59		17				P1D = 0ppm.			58.0 to 66.0 feet: SILTY SAND (SM); on non to low plasticity; 75 to 80% sail strong odor; wet.	lark brownish-gray; 15 to 20% fine nd, fine; trace cobbles, subround
60									@ 60.0 feet: 3-inch silt layer.	
61			90	CB						
62 63						PID = Oppm.				
64									@ 63.5.0 feet: odor becoming slight.	
65		6								RECEIVED
NOTES	SOL DOL DOL	ch core t ximate s	barrel s creene	oil samp ed intervi	oler. 2. el. 4. b	PtD = Photo ioi ogs = below grot	nization ind sur	detector, soil face. 5. PVC	head space reading in parts per million. 3. ( = poly vinyl chloride. 6. Odor characteristic	GW = groundweter Comple, Costint Cor of manufactured guardiant waste.
										WATER RESOURCES D

Viaul I	Foster &	Alongi	, Inc.		Project N 8128.0	lumbe	er	Borehole Log/Well Con Well Number WS-14	Sheet 4 of 11
GS)	Well Details		8.8	Sample			96_	Soil Description	
Depth (feet, BGS)	Dolella	Interval	Collection	Number	Name (Type)	Blows/8"	Lithologic Column	,	
					PID = Oppm.				
. 66		100	СВ					66.0 to 67.0 feet: SANDY SILT (ML); de to low plasticity; 20% sand, fine; mi	ark grayish-brown; 80% fines, no cageous: moderate odor moist
67								wet. 67.0 to 69.5 feet: SAND (SP); dark gray 95% sand, fine; micaceous; no noti	
68		8			PID = Oppm.			95% sand, fine; micaceous; no noti @ 68.0 feet: 2-inch sitt layer.	ceable odor; moist to wet.
69									
70							mmm	69.5 to 70.0 feet: SILT (ML); dark gray;	85% fines, low plasticity; 15%
								sand, fine; moist. 70.0 to 71.0 feet: SAND (SP); dark gray 95% sand, fine; micaceous; moist to	rish-brown; 5% fines, non plasti
71		0	СВ		PID = 0ppm. WS14-W-71			71.0 to 75.5 feet NO RECOVERY.	
72					1401-41-11				
66 67 68 69 70 71 72 73 74 75 76 77 78 79			<						
74									
75									
76		100	CB		PfD = 9.4ppm.			75.5 to 81.5 feet: SAND (SP); dark brow	wnish-aray; trace to 5% fines, no
76					ru – sappin.			plastic; 95 to 100% sand, fine; mica	ceous; slight ador; wet.
77									
78		100	CB		PID = 0ppm.				
79					rno – uppric			0.7006.4.4	
	DOI DOI							@ 79.0 feet: trace sitty balls.	
81					PED = Oppm.				
81 82 83 84 85 86 87								81.5 to 82.5 feet: SILT (ML); dark gray; sand, fine; slight odor; wet	**************************************
83								82.5 to 83.5 feet: SAND (SP); dark gray moderate odor; wet.	r, 100% sand, fine; trace fines;
84					OID - O			83.5 to 84.3 feet: SILT (ML); dark gray; sand, fine; slight odor, wet.	90% fines, medium plasticity; 1
85					PID = Oppm.		LIT.	84.3 to 84.5 feet: SAND (SP); dark gray moderate odor; wet	
								84.5 to 85.0 feet: SAND and SILT (SP-I to 1/2-inch sand and silt layers; wel	
86					WS14-W-86			85.0 to 87.5 feet. SAND (SP); dark gray fine; micaceous; odor, wet.	r, 10% fines, non plastic; 90% s JAN 23 2015
87					PID = Oppm.			MACA	
NOTES:								il head space reading in parts per million. 3, G C = poly vinyl chloride, 6, Odor characteristic o	

Maul FOSI	l Foster & Alongi, Inc.		inc.		Project N		er	Well Number	Sheet
G V	Vell		F .S	ample	8128.0 Data	71.08		WS-14 Soil Description	5 of 11
	toile	Interval Percent Recovery	Collection Method o	Number	Name (Type)	Blows/6"	Lithologic Column		
88 89 90 91 92 93 94 95 96 97 98 99 99 1000 101 102		100	CB		PID = 13ppm PID = 28.3ppn			87.5 to 88.0 feet: SANDY SILT (ML); gray; plasticity; 40% sand, fine; micaceous; le 88.0 to 89.5 feet: SILTY SAND (SM); gray; sand, fine; micaceous; slight odor; wet trace sand, fine; micaceous; moist.  89.5 to 90.5 feet: SILT (ML); dark gray; 100 trace sand, fine; micaceous; moist.  90.5 to 92.0 feet: SILTY SAND (SM); gray; sand, fine; micaceous; sheen and stroit trace sand, fine; micaceous; sheen and zones of 2-inch pockets with fine sand	noderate odor, wet. 15% fines, non plastic; 85% 15% fines, medium plasticity; 15% fines, non plastic; 85% ng odor; wet. 16s, medium to high plasticity of strong odor; moist. Severa
95 96 97 98		100	СВ		PID = Oppm.			96.0 to 98.0 feet: SANDY SILT (ML); dark plasticity; 15% sand, fine; micaceous;	strong odor, moist.
99					PID = Oppm.			98.0 to 102.0 feet: SAND (SP), dark gray; fine; micaceous; strong odor, wet. Bet 1/2-inch sitt bands intermixed with san	ween 99.0 and 99.5 feet sevi
01					WS14-W-101			@ 100.5 feet: 1-inch silt layer.	
103 104 105	المرازية	100	CB		PID = Oppm.			102.0 to 105.0 feet: SAND (SP); gray; 100 fines; sheen and strong odor, wet.	% sand, fine; mlcaceous; trac
06					PID = 84ppm.			105.0 to 105.5 feet SILT (ML); gray; 90% fine; strong odor, moist. 105.5 to 106.0 feet SAND (SP); gray; 100 fines; sheen and strong odor; wet. 106.0 to 108.0 feet SILT (ML); gray; 100% fine; trace rootlets; moderate odor; mc	% sand, fine; micaceous; trace fines; low plasticity; trace sa ist.
09	00 (00 (00 (00 00 00 00 00 00 00 00 00 0				PID = 9.5ppm			108.0 to 108.5 feet: SILTY SAND (SM); sand, fine; sheen and strong odor, we 108.5 to 110.5 feet: SILT (ML); gray; 100% fine; sheen and strong odor, moist.  @ 109.0 feet: 4-inch silty sand layer with the space reading in parts per million. WATE	fines; low plasticity; trace sa AN 2 3 2015 need and sitrong book

117	Well Details	Interval Percent	Collectio	Number 1	8128.6 Data  Name (Type)  PID = Oppm.  PID = Oppm.	Blows/6"	Lithologic	Soil Description  Soil Description  110.5 to 111.0 feet: SAND (SP); gray; 100% sand, fine; micaceous; trace fines; slight odor; wet.  111.0 to 113.0 feet: NO RECOVERY; sluff.  113.0 to 114.0 feet: SANDY SILT (ML); derk brownish-gray; 60% fines, non to low plasticity; 40% sand, fine; micaceous; faint odor; moist to
111 112 113 114 115 116 117 118 119 119	Details		Collectio	Number	Nama (Typa)  PiD = Oppm.	Blows/6"	Column	fines; slight odor, wet  111.0 to 113.0 feet. NO RECOVERY; sluff.  113.0 to 114.0 feet. SANDY SILT (ML); derk brownish-gray; 60% fines,
112 113 114 115 116 117 118		100	ОСВ					fines; slight odor; wet  111.0 to 113.0 feet. NO RECOVERY; sluff.  113.0 to 114.0 feet. SANDY SILT (ML); derk brownish-gray; 60% fines,
113 114 115 116 117					PID = Oppm.			. 113.0 to 114.0 feet: SANDY SILT (ML); derk brownish-gray; 60% fines,
114 115 116 117 118 119 119					PID = Oppm.			113.0 to 114.0 feet: SANDY SILT (ML); derk brownish-gray; 60% fines
115 116 117 118								non to low plasticity, 40% sand, line; micaceous; raint odor, moist to wet.
117								114.0 to 120.5 feet: SAND (SP); dark brownish-gray; 5% fines, non plast 95% sand, fine; micaceous; no noticeable odor; wet.
118			1					
118					PID = Oppm.			@ 116.0 feet 3-inch silt layer.
119								
120					PID = 0ppm.			
					WS14-W-120			
121		100	СВ					120.5 to 121.0 feet: SILT (ML); dark brownish-gray; 85% fines, low plasticity; 15% sand, fine; micaceous; molst. 121.0 to 132.5 feet: SAND (SP); dark gray; 100% sand, fine; trace fines;
122								micaosous; wet.
123								
124								
					PID ≈ Oppm.			@ 124 feet: sheen and strong odor present.
125 :	g go							
126 0000	00000							
127 0000	0 00 00 0 00				PID = Oppm.			
128 90 90	00000							
129 PA 9A 100 PA 100 PA 100 PA 100 PA	0 00 0 00 0 00 0 00							
130 0000	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0							@ 130 feet, sheen and strong order feeting RECEIVED
131 0000	000				PID = 0ppm.			W 150 feet. Steel and along over fauling.
10 10 01 01	20 00 00 00 00 00 00 00 00 00 00 00 00 0							JAN 2 3 2015
132 5,50	00 00 00 00 00 00							WATER RESOURCES DI SALEM, OREGON

	.l .T = -6 = - 0 . 4	W							Borehole Log/Well Construction
Maı	ıl Foster & A	101	ngı,	inc.		Project I 8128.		ər	Well Number Sheet WS-14 7 of 11
Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method g	ample I	Data Name (Type)	Blows/6"	Lithologic Column	Soil Description
133 134 135 136 137			0	СВ		PID = Оррт			132.5 to 133.5 feet: SILT (ML); dark gray/sh-brown; 90% fines, low plasticity; 10% sand, fine; micaceous; moist.  133.5 to 134.0 feet: SAND (SP); dark gray; 100% sand, fine; trace fine micaceous; wet.  134.0 to 134.5 feet: SILT (ML); dark gray/sh-brown; 90% fines, low plasticity; 10% sand, fine; micaceous; moist.  134.5 to 136.0 feet: SAND (SP); dark gray; 100% sand, fine; trace fine micaceous; wet.  @ 135.5 feet: 3-Inch sift layer.
_138 _139 _140 _141	10000		100	CB		PID = 0ppm.			138.5 to 141.5 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine; micaceous; slight odor; wet.
142 143 144			100	СВ		PID = 0ppm. WS14-W-142			141.5 to 142.0 feet: SILT (ML); dark brownish-gray, 85% fines, low plasticity; 15% sand, fine; micaceous; molst.  ② 141.7 feet: 1-inch sand layer.  142.0 to 143.0 feet: SAND (SP); gray; 100% sand, fine; trace fines; will salve trace sand; moist.  ② 143.5 feet: 3-inch sand layer.
145 146 147						PID = Oppm.			145.0 to 148.5 feet: SILT (ML); gray; 100% fines, medium to high plasticity; intermixed with 1-Inch to 2-inch sand layers; moist.
149			100	CB		PID = 0ppm. WS14-W-150			148.5 to 149.0 feet: SAND (SP); gray, 100% sand, fine; trace fines; will 149.0 to 149.5 feet: SILT (ML); gray; 100% fines, medium to high plasticity; trace sand; moist.  149.5 to 150.0 feet: SAND (SP); gray; 100% sand, fine; trace fines; will 150.0 to 167.0 feet: SAND (SP); gray; 5% fines, non plastic; 95% sand fine to medium; trace wood debris; wet.
150 151 152 153 154						PID = 0ppm.			@ 152.0 feet 2-inch silt layer. RECEIVED  JAN 2 3 2015  WATER RESOURCES DEPT SALEM, OREGON

Maii	Foster &	ΔΙο	ngi l	Inc		Project N			Borehole Log/Well Constru	Sheet
via U	ii i ostei oti	~IQI	יואוי ו	1110.		8128.0			WS-14	8 of 11
(S)	Well		>	5 St	mple	Data	19	ين	Soll Description	
Depth (feet, BGS)	Details	Interval	Percent Recovery	Collection Method <sub>Co</sub>	Number	Aforma (Time)	Blows/6	Lithologic Column		
98		inte	P. R.	Med	Nur	Name (Typė)	Bło	Contraction		
						PID = 0ppm.		200000000	@ 155.0 feet: Wood fragments.	
56				ĺ 1						
50										
57						1				
									@ 157.0 feet: 3-inch silt layer.	
58						C10 - 0				
						PtD = 0ppm.				
59										
60						]				
,0										
31										
	00000000000000000000000000000000000000					PID = 0ppm.				
52										
	506060606									
53										
34	000000000									
,	00000000 00000000 00000000					PID ≃ 0ppm.				
35	00000000000000000000000000000000000000									
	00000000									
56	00 00 00 00 00 00 00 00 00 00 00 00 00									
07	00000000									
57	1010101010 1010101010		100	CB		PID = Goom.			167.0 to 167.5 feet: NO RECOVERY; sluff.	
88	00000000000000000000000000000000000000					PID = 0ppm. WS14-W-167			167.5 to 169.5 feet: SAND (SP); gray; 100% fines; wet.	sand, fine; micaceous; trace
	00000000								IRIOS, WOL	
59	00000000000000000000000000000000000000									
									169.5 to 172.0 feet: SAND (SP); gray; 100%	sand fine: mireneque:
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	505050000									
72	000000000									
772 773 774 775 776	000000000 0000000000000000000000000000								172.0 to 173.0 feet: SILTY SAND (SM); gray, sand, fine; wet	35% fines, non plastic; 65%
73						PID = Oppm.			173.0 to 182.0 feet: SAND (SP); gray; 100%	sand fine; micaceous; trace
74	00000000000000000000000000000000000000					- upport			fines; wet	with the second second second
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75	000000000 000000000									and to the part (light
	000000000								JAN	2 3 2015
76	00000000000000000000000000000000000000					OID 0				
	00000000 00000000000000000000000000000					PID = 0ppm.			WATER RE	SOURCES DEPT 1, OREGON
								1 1 1 1 1 1 1 1 1	CALER	

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo lonization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

	.l = + 0 A					-			Borehole Log/Well Con	
viau	I Foster & A	NOI	ngı,	ınc.		Project N 8128.0		nr	Well Number WS-14	Sheet 9 of 11
38)	Well Details	T	- >	. § S	ample	Data	1.	J <sub>L</sub> C	Soll Description	n
Depth (feet, BGS)	Details	Interval	Percent Recovery	Collection Method <sub>Q</sub>	Number	Name (Type)	Blows/6	Lithologic Column		
38		Ē	<u> </u>	0.5	ž		80	20		
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33										
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36	000000000 00000000								185.5 to 186.5 feet: Sand (SP); gray; 10	00 % sand, fine, micaceous; trac
,,,	000000000 000000000 00000000					PID = 0ppm.			fines; wet	
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00	000000000									
38	000000000 000000000					1			188.0 to 190.0 feet: SILT (ML); gray; 10	00% fines, low to medium plastic
39	1010101010 010101010								damp.	
						PtD = 0ppm.			@ 189.0 feet: 2-inch fine, sand layer.	
90	000000000 000000000							11111111	190.0 to 195.0 feet: SAND (SP); gray;	100% sand, fine; micaceous; tra
11	000000000 0000000000000000000000000000								fines; wet.	
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96	000000000 00000000 00000000								196.0 to 197.0 feet: SAND (SP); gray;	1009/ sound fine: misses also to
22									financiumb	
91	00000000000000000000000000000000000000	-	90	СВ		WS14-W-197		minim	197.0 to 198.0 feet: SILT (ML); gray; 1	00% fines, medium to high
98	000000000								plasticity; damp.  198.0 to 204.0 feet: SAND (SP); gray;	JAN 2 3 2015
						PID = 0ppm.			micaceous; trace tines; wet.	
99	000000000 000000000								WA	ATER RESOURCES DEP
00										SALEM, OREGON
96 97 98 99 99 900 VOTE	ES: 1. CB = 4x6-inc	h con	barrel :	soil sam	pler. 2	PID = Photo io	nization	n detector, so	il head space reading in parts per million. 3, ( C = poly vinyl chloride. 6. Odor characteristic	GW = groundwater sample, dashed g

4/13/07 W:\GINT\GINT\MPROJECTS\B128-01\WS14-17.GPJ

GBLWC

				ologic B	orehole Log/Well Cons	truction
Maul	Foster &	Alongi, Inc.	Project Numbe 8128.01.08	r	Well Number WS-14	Sheet 11 of 11
Depth (feet, BGS)	Well Details	Interval Percent Recovery Collection Method go	ample Data  Name (Type)  Name (Type)	Lithologic Column	Soil Description	

Well WS14-125: 0.0 to 109.0 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe. 109.0 to 124.0 feet bgs: 2-inch diameter, stainless steel wire wrapped screen, 0.010-slot.

124.0 to 125.0 feet bgs: 2-inch diameter, stainless steel sump.

Well WS14-161; 0.0 to 145.0 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe. 145.0 to 160.0 feet bgs: 2-inch diameter, stainless steel wire wrapped screen, 0.010-stot. 160.0 to 161.0 feet bgs: 2-inch diameter, stainless steel sump.

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JAN 23 2015

WATER RESOURCES DEPT

NOTES:

GBLWC WYGINTYGINTWAPROJECTS/8128-01/WS14-17,GPJ 4/13/07

SALEM, OREGON

1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, deshed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

# ATTACHMENT C

**OWRD WELL LOGS** 

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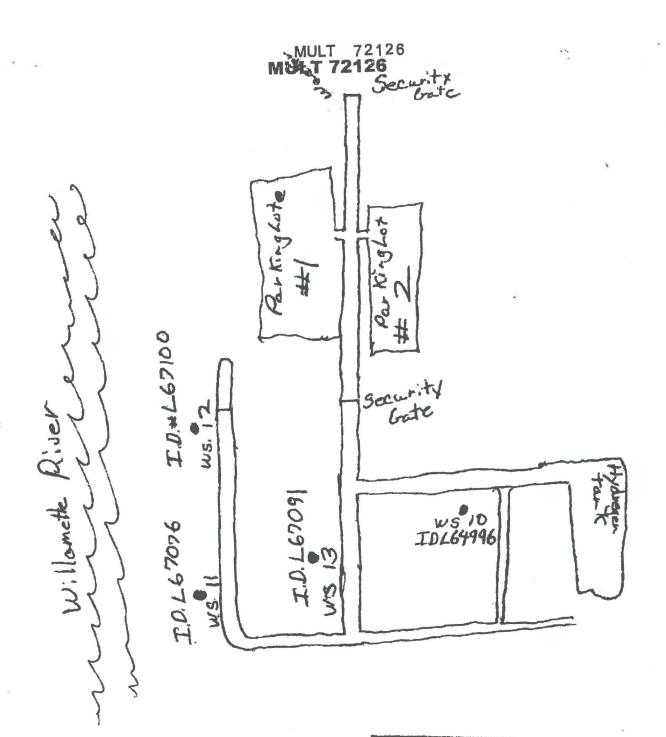
JAN 23 2015

WATER RESOURCES DEPT SALEM, OREGON



MONITORING WELL REPORT	24268 97/2
MONITORING WELL REPORT (as regulard by ORS 537.763 & OAR 690-240-095)	14 267
Instructions for completing this report are on the last page of this form.	Start Card # 10147655
(1) OWNER/PROJECT; WELL NO. W., S. []	(6) LOCATION OF WELL By legal description
Name Was Ker Siltronic Com	Well Location: County Multhambh
City Portland State Ov Zip 97210	Township / N (N or S) Range / W (E or W) Section 13
(2) TYPE OF WORK:	2. Either Street address of well location 7200 NW
	Front Ave Portland On
New construction Alteration (Repair/Recondition)	or Tax lot number of well location 12.00
Conversion Decepening Abandonment	<ol> <li>ATTACH MAP WITH LOCATION IDENTIFIED. Map shall include approximate scale and north arrow.</li> </ol>
(3) DRILLING METHOD	(7) STATIC WATER LEVEL:
Rotary Air Rotary Mud Cable	27.4 Ft. below land surface. Date 10-20-63
Hollow Stern Auger Other Sen C	Artesian Pressure
BORE HOLE CONSTRUCTION	(8) WATER BEARING ZONES:
Yes No	Depth at which water was first found
Special Standards 12 Depth of completed well 23 ft.	Prom To Est Flow Rate SWL
Vault	KECEIVED
On. Whiter-light cover	1111 10 0 0001
Surface flush vault Locking cap	JUL 0 6 2004
Casing	(9) WELLLOG: Ground elevation MATER RESOURCES DEPT
in diameter 2 in	
material PUC Welded Threaded Glued	Material Proma To SWL
\$2.50   \$2.50   B □	Sala Light Brown 1 30
Seal Co. C. Liner	Siltwith Layerrof 30
15 ft. DD 90 diameter 100 in.	Sand Black with 52
material material Welded Threaded Glood	Laxer 0517 187
	5:144 Grave 187 203
104 ft. Office Well seal:  Material Bendenite Gran	+ Basalt 203 200
1030 Amount 1950 163	
Grout weight # 10,0	1.0
Borehole diameter	DECEIVED
Bentonite plug at least 3 ft. th	
TOTAL STATE OF SCIENT	
Filter pack CR CR material States	DEC 1 0 2003
10th 80.51 1 20.53 Prom /09 To 124	WATER RESOURCES CEPT SALEM, OREGON
70 ( Spil From To	OALDE, OILEGO,
/25 A. Slot size 10 in.	
Meett and Material Sand	Date started 9-2/-03 Completed /0-2/-03
125- Quya auga Size 10-20 in.	
107	(unbonded) Monitor Well Constructor Certification:  I certify that the work I performed on the construction, alteration, or
(5) WELLTEST:  Pump Bailer Air Flowing Artesian	abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to the best
Permeability Yield / GPM	knowledge and belief MWC Number 10/92
Conductivity 576 USICH PH 643	Signed Date
Temperature of water 16.02 °F/C Depth artesian flow found ft.  Was water analysis done? Yes No	(booded) Monitor Well Constructor Certification:
By whom?	I accept responsibility for the construction, alteration, or abandomment work performed on this well during the construction dates reported above. All
Depth of strata to be analyzed. From ft. to ft.	work performed during this time is in compliance with Oregon well construction
Remarks:	standards. This report is true to the best of my knowledge and belief.
Name of supervising Geologiss/Engineer Man Engler & Along	Signed Hille lilers Bon Horas
ORIGINAL & FIRST COPY-WATER RESOURCES DEPARTMEN	/
	IAN 2 3 2015

STATE OF OREGON ONITORING WELL REPORT	72126 2126 D# L67 Start Card # W 147 6.55
a required by ORS 537.765 & OAR 690-240-095)	Start Card # W 147 6 55
) OWNER/PROJECT: WELL NO.	(6) LOCATION OF WELL By legal description
ame Was Ker	Well Location: County hutnoman
ddress 2200 N. W Front Ave	Township N (N or S) Range W (E or W) Section 13
ity Portland Spin-Or 199220	1. 5 W 1/4 of 5 W 1/4 of above section.
TYPE OF WORK: HECEIVED	2. Either Street address of well location 2200 N. W.Front
	Ave Portland on
New construction Alteration (Repair Respondings)	or Tax lot number of well location 1200
Conversion Deepening Abandonment	3. ATTACH MAP WITH LOCATION IDENTIFIED. Map shall include approximate scale and north arrow.
WATER RESOURCES DEPT	(7) STATIC WATER LEVEL:
DRILLING METHOD SALEM, OREGON	
Rotary Air Rotary Mud Cable	27.9 R. below land surface. Date 10-20-03
Hollow Stem Auger Other Soni C	Artesian Pressure lb/sq. in. Date
A BORE HOLE CONSTRUCTION	(8) WATER BEARING ZONES:
Yes No	Depth at which water was first found
pecial Standards 🛣 🗌 Depth of completed well 18	From To Est. Flow Rate SWL
Land surface	145 160 .75 27.9
Vault	
1 Water-tight cover	
Surface flush vault	
Locking cap	
Casing	(9) WELLLOG: Ground elevation
SODE diameter	n.
1.5 material PUC	Material From To SW
DATE OF THE PROPERTY OF THE PR	lop soil
125 Spid Spid Inreaded Cities	Sand Light Brown 1 30
Seal O. C. Liner	Sitt with Layers 30
25 ft. OSOS diameter NONC	
material	Sand Black with 52
TO Velded Threaded Glued	Vaxor's of silt 182
	Sitty Grave 187 203
40 ft. Well seal:	1 Basa + 203 207
Good Material Material	Layer Layer
10.830 Amount 200 183	
Grout weight 10,0	
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50,0 in.	
Bentomite plug at least 3 ft.	mex Wall was 8 at 5 11.4 . The
Filter OR O Screen material State C.S.	S I and But to a //de
pack   Section   Section   Interval   Interval   Section   Interval   Int	From 161 to 207
140t 90.09 1 10.00 From 145 To 160	770M /BI /B 201
70 \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	,
/61 ft.   20 2	
Filter pack:	
Material Sond	Date started Completed 10-21-03
60890 Size 10-20 in.	
C 6003	(unbonded) Monitor Well Constructor Certification:
) WELLTEST:	I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction
Pump Bailer Air Flowing Artesian	standards. Materials used and information reported above are true to the bes
Permeability Yield 75 GPM	knowledge and belief. MWC Number
Conductivity 451 US/cmPH 6.61	Signed Date
Temperature of water 45, 25 °FC Depth artesian flow found	ft. RECEIVED
Was water analysis done? Yes No	(bonded) Monitor Well Constructor Certification:
By whom?	I accept responsibility for the construction, alteration, or abandonment
Depth of strata to be analyzed. From ft. to	work performed on this well during the construction dates reported above. A work performed during this time is in compliance with oregon well-construct
Remarks:	standards. This report is true to the best of my knowledge and belief.
	WATER AWGOLINGES DE



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WATER RESOURCES DEPT SALEM, OREGON

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JAN 23 2015

WATER RESOURCES DEPT SALEM, CREGON

#### **MULT 72126**



Water Resources Department

Commerce Building 158 12th Street NE Salem, OR 97301-4172 503-378-3739 FAX 503-378-8130

September 2, 2003

MARK KNOLLE #10437 C/O PROSONIC CORP 305 E. COMSTOCK DR CHANDLER AZ 85225

#### FINAL ORDER

Dear Mr. Knolle:

The special standard request you submitted for owner: Wacker Siltronic, start card numbers 147653-147655 is approved for the following: multiple completion wells, the wells will have two (2) 2 inch wells in each borehole. See Oregon Administrative Rule (OAR) 690-240-0410(5). Your special standard request form is enclosed.

The Well Construction Standards serve to protect ground water resources. By approving and issuing this special construction standard the Oregon Water Resources Department is not representing that a well constructed in accordance with this condition will maintain structural integrity or that it meets engineering standards. The well constructor/or landowner is responsible for ensuring that a well is constructed in a manner that protects ground water resources as required under Oregon Administrative Rules 690-200 through 690-240.

If you have any questions concerning this letter, I may be contacted at (503) 378-8455 ext 283, or by e-mail at tracy.l.eichenlaub@wrd.state.or.us.

Sincerely,

Ms. Tracy Eichenlaub
Well Construction Specialist

Enforcement Section

enclosure

cc: Dorothy Pedersen, NW Region Monitor Well Inspector

This is a final order in other than a contested case. This order is subject to judicial review under ORS 183.484. Any potition for judicial review of the order must be filed within the 60 day time period specified by ORS 183.484(2). Pursuant to ORS 536.075 and OAR 137.004-0080 and OAR 690-01-0005 you may either petition for judicial review or petition the Director for reconsideration of this order.

RECEIVED

#### **MULT 72126**



Water Resources Department

Commerce Building 158 12th Street NE Salem, OR 97301-4172 503-378-3739 FAX 503-378-8130

October 6, 2003

MARK KNOLLE #10437 C/O PROSONIC CORP 305 E. COMSTOCK DR CHANDLER AZ 85225

#### FINAL ORDER

Dear Mr. Knolle:

The special standard request you submitted for owner: Wacker Siltronic, start card number 147655 is approved for the following: use of bentonite below 50 feet and through more than 25 feet of water, 3/8 inch bentonite pellets will be used to abandon the bottom of the hole from 206 feet to 160 feet. See Oregon Administrative Rule (OAR) 690-240-0475(3). Your special standard request form is enclosed.

The Well Construction Standards serve to protect ground water resources. By approving and issuing this special construction standard the Oregon Water Resources Department is not representing that a well constructed in accordance with this condition will maintain structural integrity or that it meets engineering standards. The well constructor/or landowner is responsible for ensuring that a well is constructed in a manner that protects ground water resources as required under Oregon Administrative Rules 690-200 through 690-240.

If you have any questions concerning this letter, I may be contacted at (503) 986-0851, or by e-mail at tracy.l.eichenlaub@wrd.state.or.us.

Sincerely.

Ms. Tracy Eichenlaub Well Construction Specialist

**Enforcement Section** 

enclosure

cc: Dorothy Pedersen, NW Region Monitor Well Inspector

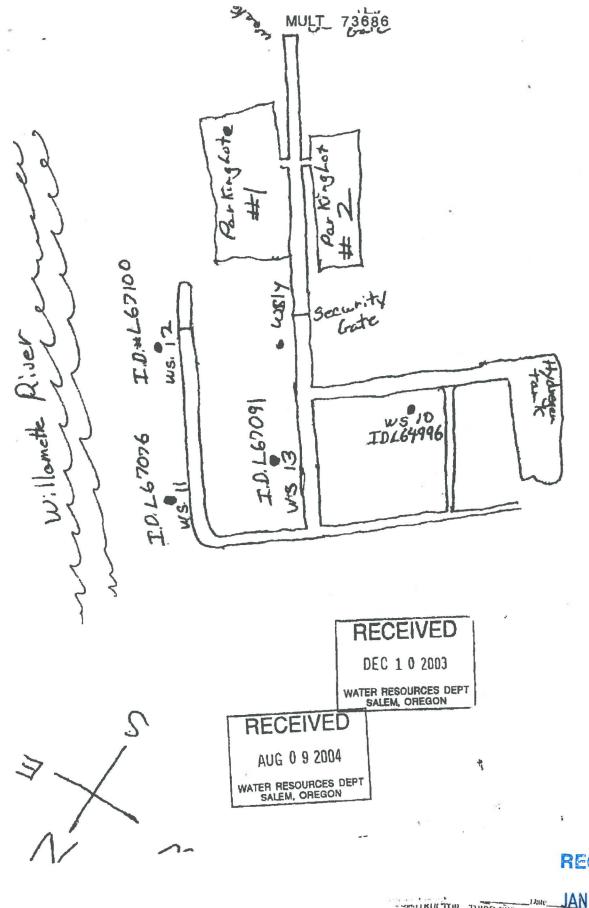
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tion the Director for reconsideration of this order.

OCT 0 9 2083

STATE OF OREGON .	725-
MONITORING WELL REPORT [188 required by ORE 537.765 & OAR 690-240-095]	Sunt Cond # 1(44)31
instructions for committing this report are on the last mare of this harm.  (1) OWNER/PROJECT: WELL NO. 125-12	(6) LOCATION OF WELL By legal description
Name Giltronic Corporation	Well Location: County Holly Mendo
Allton 7200 NW Front Ane	Township (N) St Runge (E of W) Southur /3
City Par-Heunel State DR. Zin 97210	1. NW 14 16 NW 14 of above sections.
(2) TYPE OF WORK:	2. Either Street address of well location 7200 ARD Front
New construction Alteration (Repair/Recondition)	or Tax for number of well forming 1200
Conversion [] Deepening [] Abunkunnen	<ol> <li>ATTACH MAP WITH LICATION IDENTIFIED. Map study include opprusionate scale and north arrow.</li> </ol>
(3) DRILLING METHOD	(7) STATIC WATER LEVEL:
Rotary Air   Rotary Mud   Cuble   Hollow Stein Auger   Other   Colle	Artesian Pressure and surface & Total COVED
14) BORE HOLE CONSTRUCTION	(8) WATER BEARING ZONES:
Nts Ni	Depth at which water was first found
Special Standards Open Open of completed well 101 for	From To Est. Flow Rate SWL
Vanil	
When-right curver	NOTORSERUED
n. lacking cup	
Casing	(9) WELLLOG: Grand devation
So Di diameter 2 2 in	
Co C tualerial AL AL	Material From To SWI,
We hed Threaded Glass	Sanctifficants 0 40
Scul Z	Busil- SOY
(alen.   6.45   dianeter in.	
BD BL munerial	
TO ODOO Welder! Threathed Ghard	Nobel Well Special Standard
145 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Request on file.
Malerial Bentonil	Drilled well to 204 back-
PO TO Annant GOODS 40	
Grant wright 9	BOY! RUILE!
Rorehole dinineter	D - Y CW   V - V   D - V - V
1000 in	Beologith (18) 304
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Filter Page 1	
panik sign billion bil	AUG 0 9 2004
Pron_111_To_126	
11 D C 2000   100   100   100	WATER RESOURCES DEPT SALEM, OREGON
Stu size 1010 in.	GREEN, OREGON
Fifter packt Material Scan CO	Date started LOSTION Completed 7 18167
6896 Size 10x20 In.	par sinter TOGITO
C 2433	tunbunded) Monitor Well Constructor Certification:  1 certify that the work I performed on the construction, alternation, or
) WELLTEST:	abandomment of this well is in compliance with Oregon well construction
Pump Builer Air Fluving Artesius	standards. Malerighs used and information reported above are true to the best knowledge and helief.
Permentifly Yield GPM	MWC NURBER 703
Conductivity PH Temperature of water PH Repth artesian flow found fi.	Signed 1 ele//   Date   0011   01107
Was water analysis done?	(bunded) Monitor Well Constructor Certification:
By when!	I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All
Depth of strain to be unalyzed. The S. C. Party [t.	work performed during this time is in compliance with Oregon well construction
Remarks	standards. This report is true to the hop of my knowledge and belief.
	MWC Number / CZ V
Name of Marrywing Geologis/Engineer	Shaned Date 1241 97



- SENTINUCTOR THEO COPY CUSTOMER

#### **Kerry Gallagher**

From:

BAYUK Dana <BAYUK.Dana@deq.state.or.us>

Sent:

Tuesday, January 28, 2014 9:19 AM

To:

James Peale

Cc:

Burr, Myron; Gladstone, Alan; Church, Brian (BCHURCH@davisrothwell.com); Chris Reive (Chris.Reive@jordanramis.com); Earle, William G. (WEARLE@davisrothwell.com);

Kerry Gallagher; BYRD Kristopher R; LARSEN Henning

Subject:

RE: Siltronic - Conversation Confirmation

#### Good morning James.

This e-mail confirms that during our telephone conversation yesterday I informed you that Siltronic Corporation should prepare a plan for abandoning monitoring well WS-14-161. The screen and sand pack interval of this monitoring well penetrates through the "deep aquitard" identified beneath the Siltronic property. The appearance of dense-non aqueous phase liquid (DNAPL) in the monitoring well indicates the installation is acting as a pathway for contamination to migrate vertically downward through the deep aquitard into deeper intervals of the Alluvium water-bearing zone.

As I indicated during yesterday's call, based on the information summarized above DEQ has determined that abandonment of WS-14-161 is required under the TCE Order (DEQ No. VC-NWR-03-16). Abandonment of WS-14-161 should be conducted consistent with OAR-690-240 and previously approved protocols for abandoning monitoring wells at the Gasco and Siltronic sites (e.g., use of organoclay-bentonite sealant).

Previous work at the adjoining Gasco Site identified potential causes for DNAPL to appear in monitoring wells including: 1)migration of DNAPL to the monitoring well location; and/or 2) vertical migration of DNAPL down the borehole due to failure of the monitoring well seal. Siltronic should assess the cause of DNAPL appearance in WS-14-161 by videoing the inside of the 2-inch monitoring well casing and screen prior to abandonment and, to the extent practicable documenting visual evidence of the depth of DNAPL occurrence during abandonment.

As indicated in your e-mail, Siltronic should submit the abandonment plan for WS-14-161 on or before February 14, 2014.

Please don't hesitate to contact me with questions regarding this e-mail.

Mr. Dana Bayuk, Project Manager
NW Region Cleanup & Site Assessment Section
Oregon Department of Environmental Quality
2020 SW 4th Avenue, Suite 400
Portland, OR 97201
E-meil: heavily department or us

E-mail: bayuk.dana@deg.state.or.us

Phone: 503-229-5543 FAX: 503-229-6899

Please visit our website at http://www.oregon.gov/DEQ/



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From: James Peale [mailto:jpeale@maulfoster.com]

Sent: Monday, January 27, 2014 4:50 PM

To: BAYUK Dana

**Cc:** Burr, Myron; Gladstone, Alan; Church, Brian (<u>BCHURCH@davisrothwell.com</u>); Chris Reive (<u>Chris.Reive@jordanramis.com</u>); Earle, William G. (<u>WEARLE@davisrothwell.com</u>); Kerry Gallagher

**Subject:** Siltronic - Conversation Confirmation

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#### Dana -

This email is provided as a continuation to our conversation of this morning. For the purposes of documentation, Siltronic requires DEQ's email confirmation that DEQ has directed Siltronic to submit a workplan for the abandonment of nested wells WS-14-125 and WS-14-161. The workplan is due February 14, 2014. Please also confirm that the workplan should describe abandonment consistent with WRD regulations (e.g., OAR 690-220 Abandonment of Wells).

MFA is prepared to submit the workplan consistent with these requirements. Please note that if the workplan is approved, Siltronic will require written direction from DEQ in order to proceed with the abandonment.

Thanks in advance, Dana.

jp

JAMES G.D. PEALE RG, LHG | MAUL FOSTER ALONG!

d. 503 501 5218 | p. 971 544 2139 | c. 503 449 9576 | f. 971 544 2140 | www.maulfoster.com

2001 NW 19th Avenue, Suite 200, Portland, OR 97209

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JAN 23 2015

WATER RESGURCES DEPT SALEM, OREGON From:

BAYUK Dana

To:

Kerry Gallagher

Cc:

James Peale; Burr, Myron (Myron, Burr@siltronlc.com); Gladstone, Alan (AGLADSTONE@davisrothwell.com); Church, Brian (BCHURCH@davisrothwell.com); Earle, William G. (WEARLE@davisrothwell.com); Chris Reive (Chris.Relve@jordanramis.com); JOHNSON Keith; koch.kristine@epa.gov; Sheldrake.Sean@epamail.epa.gov; Fuentes.Rene@epamail.epa.gov; Peterson. Lance (PetersonLE@cdmsmith.com); pdost@pearllegalgroup.com; John Edwards (jedwards@anchorgea.com); Carl Stivers (cstivers@anchorgea.com); rjw@nwnatural.com; Rob

Ede (robe@hahnenv.com); BYRD Kristopher R; GAINER Torn; LARSEN Henning; MCCLINCY Matt

Subject:

RE: Siltronic: Monitoring Well WS-14 Abandonment WP

Date:

Thursday, April 10, 2014 5:42:12 PM

#### Good afternoon Kerry.

DEQ reviewed the "Monitoring Well WS-14 Abandonment Plan, Siltronic Corporation, 7200 NW Front Avenue, Portland, OR - ECSI No. 183" dated February 14, 2014 (Abandonment Plan). As we discussed by telephone the Abandonment Plan provides insufficient information regarding decommissioning procedures, particularly with respect to over-drilling and removing monitoring well construction materials.

As requested by DEQ, the Abandonment Plan includes a task to video log the WS-14-125/161 monitoring wells before they are decommissioned. During telephone discussions we concluded the video log could provide useful information for developing the approach to decommissioning the two installations. Based on this conclusion, DEQ verbally approved Siltronic moving forward with video logging. This e-mail provides DEQ's written approval for Siltronic to proceed with the video logs of WS-14-125/161.

DEQ understands video logging will be conducted on April 11, 2014. DEQ requests that three copies of the log be provided on disc for our information and use. This e-mail also acknowledges that you notified me of the work and schedule during our phone discussion on April 3<sup>rd</sup>.

Please feel free to contact me with questions regarding this e-mail.

#### Dana

Mr. Dana Bayuk, Project Manager NW Region Cleanup & Site Assessment Section Oregon Department of Environmental Quality 2020 SW 4th Avenue, Suite 400 Portland, OR 97201

E-mail: bayuk.dana@deq.state.or.us

Phone: 503-229-5543 FAX: 503-229-6899

Please visit our website at http://www.oregon.gov/DEQ/



please consider the environment before printing this email

RECEIVED

JAN 23 2015

From: Kerry Gallagher [mailto:kgallagher@maulfoster.com]

WATER RESOURCES DEPT SALEM, OREGON

Sent: Friday, February 14, 2014 3:58 PM

To: BAYUK Dana

Cc: James Peale; Burr, Myron (Myron.Burr@siltronic.com); Gladstone, Alan (AGLADSTONE@davisrothwell.com); Church, Brian (BCHURCH@davisrothwell.com); Earle, William G. (WEARLE@davisrothwell.com); Chris Reive (Chris.Reive@jordanramis.com); JOHNSON Keith; koch.kristine@epa.gov; Sheldrake.Sean@epamail.epa.gov; Fuentes.Rene@epamail.epa.gov; Peterson, Lance (PetersonLE@cdmsmith.com); pdost@pearllegalgroup.com; John Edwards (jedwards@anchorqea.com); Carl Stivers (cstivers@anchorqea.com); rjw@nwnatural.com; Rob Ede (robe@hahnenv.com); GAINER Tom; LARSEN Henning; MCCLINCY Matt Subject: Siltronic: Monitoring Well WS-14 Abandonment WP

Dana,

As requested, please find the attached Monitoring Well WS-14 Abandonment Work Plan for your review and approval. The required hard copies of this submittal will follow by mail.

Please call or email if you have any questions. Thank you,

KERRY-CATHLIN GALLAGHER | MAUL FOSTER & ALONGI, INC.

direct. 503 501 5229 | main office. 971 544 2139 | cell. 503 896 0255 | fax. 971 544 2140 | <u>www.maulfoster.com</u> 2001 NV 19th Avenue, Suite 200, Portland, Oregon 97209

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### **Kerry Gallagher**

From: BAYUK Dana <BAYUK.Dana@deq.state.or.us>

Sent: Wednesday, June 25, 2014 4:38 PM
To: 'Burr, Myron (Myron.Burr@siltronic.com)'

Cc: 'Gladstone, Alan (AGLADSTONE@davisrothwell.com)'; James Peale; Kerry Gallagher;

Bob Wyatt; Patty Dost; 'John Edwards (jedwards@anchorqea.com)'; 'Ben Hung'; John

Renda; Rob Ede; 'Sheldrake, Sean'; Mullin, Jeanette; 'Peterson, Lance

(PetersonLE@cdmsmith.com)'; Coffey, Scott; BYRD Kristopher R; JOHNSON Keith;

GAINER Tom; LARSEN Henning; MCCLINCY Matt

Subject: RE: Siltronic: Monitoring Well WS-14 Abandonment WP

#### Good afternoon Myron.

Consistent with DEQ's April 10, 2014 e-mail (see below), Siltronic Corporation (Siltronic) completed video logging of monitoring wells WS-14-125 and WS-14-161 on April 14, 2014. DEQ reviewed the video logs and concludes that dense non-aqueous phase liquids (DNAPLs) are entering the monitoring well screens and sand-packed intervals of both installations. These two monitoring wells are constructed in a single borehole and together are designated "WS-14-125/161."

In addition, as indicated in our May 20, 2014 letter commenting on the Phase 1-Step 4 Report (see footnote), DEQ concludes the screen and sand-packed intervals of monitoring wells WS-11-161 and WS-14-161 penetrate the deep aquitard and hydraulically connect the upper lower Alluvium water-bearing zone (WBZ) and the deep lower Alluvium WBZ.

Monitoring well WS-11-161 is collocated with WS-11-125 in a single borehole and the two wells together are designated "WS-11-125/161." Groundwater contamination is documented in both of these monitoring wells.

Based on the information summarized above, DEQ further concludes that:

- Monitoring wells WS-14-125 and WS-14-161 represent potential pathways for DNAPLs to migrate vertically downward into deeper intervals of the upper lower Alluvium WBZ and deep lower Alluvium WBZ; and
- Monitoring well WS-11-161 represents a potential pathway for groundwater contamination in the upper lower Alluvium WBZ to migrate vertically downward into the deep lower Alluvium WBZ.

DEQ requires that WS-11-125/161 and WS-14-125/161 be permanently abandoned through over drilling and removal consistent with OAR 690-290-0510. Siltronic should prepare and submit a work plan for this purpose for DEQ's review within 30-days of receiving this e-mail.

DEQ acknowledges and appreciates the video logs of WS-14-125/161. The logs were very useful for determining the status of the installations. Please don't hesitate to contact me with questions regarding this e-mail.

#### Dana

Mr Dana Bayuk, Project Manager NW Region Cleanup & Site Assessment Section Oregon Department of Environmental Quality 2020 SW 4th Avenue, Suite 400 Portland, OR 97201 E-mail: bayuk.dana@deq.state.or.us

Phone: 503-229-5543 FAX: 503-229-6899 RECEIVED



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Footnote. Anchor QEA, LLC, 2014, "Data Report: Groundwater Source Control Extraction System Test - Phase 1 Step 4 – NW Natural Gasco Site," April 10, a report prepared for NW Natural.

From: BAYUK Dana

Sent: Thursday, April 10, 2014 5:41 PM

To: 'Kerry Gallagher'

Cc: James Peale; Burr, Myron (Myron.Burr@siltronic.com); Gladstone, Alan (AGLADSTONE@davisrothwell.com); Church, Brian (BCHURCH@davisrothwell.com); Earle, William G. (WEARLE@davisrothwell.com); Chris Reive (Chris.Reive@jordanramis.com); JOHNSON Keith; koch.kristine@epa.gov; Sheldrake.Sean@epamail.epa.gov; Fuentes.Rene@epamail.epa.gov; Peterson, Lance (PetersonLE@cdmsmlth.com); pdost@pearllegalgroup.com; John Edwards (jedwards@anchorqea.com); Carl Stlvers (cstivers@anchorqea.com); rjw@nwnatural.com; Rob Ede (robe@hahnenv.com); BYRD Kristopher R; GAINER Tom; LARSEN Henning; MCCLINCY Matt

Subject: RE: Siltronic: Monitoring Well WS-14 Abandonment WP

Good afternoon Kerry.

DEQ reviewed the "Monitoring Well WS-14 Abandonment Plan, Siltronic Corporation, 7200 NW Front Avenue, Portland, OR - ECSI No. 183" dated February 14, 2014 (Abandonment Plan). As we discussed by telephone the Abandonment Plan provides insufficient information regarding decommissioning procedures, particularly with respect to over-drilling and removing monitoring well construction materials.

As requested by DEQ, the Abandonment Plan includes a task to video log the WS-14-125/161 monitoring wells before they are decommissioned. During telephone discussions we concluded the video log could provide useful information for developing the approach to decommissioning the two installations. Based on this conclusion, DEQ verbally approved Siltronic moving forward with video logging. This e-mail provides DEQ's written approval for Siltronic to proceed with the video logs of WS-14-125/161.

DEQ understands video logging will be conducted on April 11, 2014. DEQ requests that three copies of the log be provided on disc for our information and use. This e-mail also acknowledges that you notified me of the work and schedule during our phone discussion on April 3<sup>rd</sup>.

Please feel free to contact me with questions regarding this e-mail.

#### Dana

Mr. Dana Bayuk, Project Manager NW Region Cleanup & Site Assessment Section Oregon Department of Environmental Quality 2020 SW 4th Avenue, Suite 400 Portland, OR 97201

E-mail: bayuk.dana@deq.state.or.us

Phone: 503-229-5543 FAX: 503-229-6899

Please visit our website at http://www.oregon.gov/DEQ/



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From: Kerry Gallagher [mailto:kgallagher@maulfoster.com]

Sent: Friday, February 14, 2014 3:58 PM

To: BAYUK Dana

JAN 2 0 2015

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Cc: James Peale; Burr, Myron (Myron.Burr@siltronic.com); Gladstone, Alan (AGLADSTONE@davisrothwell.com); Church,

Brian (BCHURCH@davisrothwell.com); Earle, William G. (WEARLE@davisrothwell.com); Chris Reive (Chris.Reive@jordanramis.com); JOHNSON Keith; koch.kristine@epa.gov; Sheldrake.Sean@epamail.epa.gov; Fuentes.Rene@epamail.epa.gov; Peterson, Lance (PetersonLE@cdmsmith.com); pdost@pearllegalgroup.com; John Edwards (jedwards@anchorqea.com); Carl Stivers (cstivers@anchorqea.com); rjw@nwnatural.com; Rob Ede (robe@hahnenv.com); GAINER Tom; LARSEN Henning; MCCLINCY Matt

Subject: Siltronic: Monitoring Well WS-14 Abandonment WP

Dana,

As requested, please find the attached Monitoring Well WS-14 Abandonment Work Plan for your review and approval. The required hard copies of this submittal will follow by mail.

Please call or email if you have any questions. Thank you,

KERRY-CATHLIN GALLAGHER | MAUL FOSTER & ALONGI, INC.

direct. 503 501 5229 | main office. 971 544 2139 | cell. 503 896 0255 | fax. 971 544 2140 | www.maulfoster.com 2001 NW 19th Avenue, Suite 200, Portland, Oregon 97209

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JAN 2 3 2015



Water Resources Department

North Mall Office Building 725 Summer St NE, Suite A Salem, OR 97301 Phone (503) 986-0900 Fax (503) 986-0904 www.wrd.state.or.us

January 26, 2015

TRENT CASTNER MWC# 10306 CASCADE DRILLING LP 13600 SE AMBLER ROAD CLACKAMAS, OREGON 97105

#### FINAL ORDER

Dear Mr. Castner:

The Special Standards Request Form you submitted for owner: Siltronic Corporation, Start Card number 1025433 (Client Number WS-14) is hereby approved for the following: You may abandon this nested monitoring well as described in your Special Standards Request Form. You may use an Organoclay based grout (see attached) to abandon the over drilled monitoring well in the intervals where NAPL is present. In intervals where NAPL is not present an approved sealing material shall be used. If you are going to use bentonite grout to abandon the well, then it may only be used to abandon the portion of the well that is below the static water level. Above the static water level another approved sealing material must be used. A copy of your Special Standards Request Form is enclosed. All other standards must be adhered to.

The Well Construction Standards serve to protect ground water resources. By approving and issuing this special construction standard the Oregon Water Resources Department is not representing that a well constructed in accordance with this condition will maintain structural integrity or that it meets engineering standards. The well constructor/or landowner is responsible for ensuring that a well is constructed in a manner that protects ground water resources as required under Oregon Administrative Rules 690-200 through 690-240.

If you have any questions regarding this letter, I may be contacted at (503) 986-0852, or by e-mail at Joel.W.Jeffery@wrd.state.or.us.

Sincerely,

Joel Jeffery, Coordinator Well Construction Program

Well Construction and Compliance Section

enclosure

cc: NW Region Well Inspector

File

This is a final order in other than a contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review must be filed within the 60 day time period specified by ORS 183.484(2). Pursuant to ORS 536.075 and OAR 137-004-0080 you may either petition for judicial review or petition the Director for reconsideration of this order. A petition for reconsideration may be granted or denied by the director, and if no action is taken within 60 days following the date the petition was filed, the petition shall be deemed denied.



# **Special Standards**

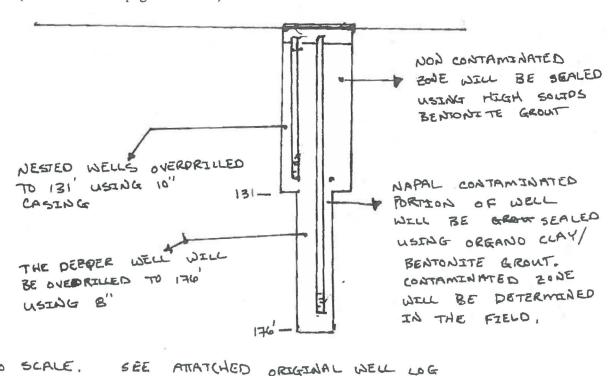
#### **Request Form**

#### REQUEST FOR WRITTEN APPROVAL TO USE CONSTRUCTION METHODS NOT INCLUDED IN OREGON ADMINISTRATIVE RULES 690-200 THROUGH 690-240

Before the request can be considered, this form must be completed. Requests shall be submitted to the Well Construction Program Coordinator, Water Resources Department, 725 Summer Street NE, Suite A, Salem OR 97301-1266. Requests may also be considered by the appropriate Regional Manager.

Date	of request: 1/21/2015 Oral approval date (if applicable):			
Bond	ded Well Constructor (name, license #, and mailing address): Trent Castner 10306			
	13600 SE Ambler RD, Clackamas, OR 97105			
1)	Location of Well: <u>NW</u> 1/4 <u>NW</u> 1/4 Tax lot <u>1200</u> Section <u>13</u>	,		
	Township 1 N , Range 1 W , Multnomah Cou	unty		
	Address at well site: 7200 NW Front Ave., Portland, OR			
2)	Start Card Number(s)(for work to be done):			
3)	Name and Address of Land Owner: Siltronic Corporation			
	7200 NW Front Ave, Portland, OR			
4)	Distance to the nearest septic tank, drainfield, closed sewage line (if water supply wel	l)		
	Unkown			
5)	The unusual site conditions which necessitate this request:Abandonment of a nested			
	well in a known NAPAL contaminated zones which will prevent the hydration of the bentonite in			
	the high solids slurry.			
6)	The proposed construction methods that the bonded well constructor believes will be adequate for this well: (attach additional pages if needed)			
	I propose that we overdrill the nested well (original start card number 164732 client number W3-14) and that	t we		
	use a high solids bentonite grout combined with Oragano Clay in the zones determined to	DP06	· Polo	
	be contaminated with NAPAL. The rest of the well borehole will be abandoned using high solids benonite sle	urry.	EI	/E
	* CLIENT I.D. WS IN	JAN :		

(7)Diagram showing the pertinent features of the proposed well design and construction: (attach additional pages if needed)



#### PLEASE NOTE:

- The Well Construction Standards serve to protect ground water resources. By approving (1) and issuing this special construction standard the Oregon Water Resources Department is not representing that a well constructed in accordance with this condition will maintain structural integrity or that it meets engineering standards. The well constructor/or landowner is responsible for ensuring that a well is constructed in a manner that protects ground water resources as required under Oregon Administrative Rules 690-200 through 690-240.
- (2)If it should be determined at some future date that the well, due to its construction, is allowing ground water contamination, waste or loss of artesian pressure, the undersigned shall return to the site and rectify the problem.
- (3)If oral approval was granted, a written request must be submitted to the Department either within three (3) working days of the date of oral approval or prior to the completion of the associated well work. Failure to submit a written request as described above may void prior oral approval.

I have read and understand the above information. I further attest that the information provided is accurate to the best of my knowledge.

Bonded Constructor Signature: J. Front Castral

SEE ATTACLED WORK PLAN

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#### HAHN AND ASSOCIATES, INC.

**ENVIRONMENTAL CONSULTANTS** 

RECEIVED

September 18, 2008

SEP 29 2008

Mr. Kristopher Byrd
Oregon Water Resources Department
Well Construction and Compliance Section
458-42<sup>th</sup> Street NE, S4c, A
Salem, Oregon 97310

WATER RESOURCES DEPT SALEM, OREGON

725 Summer

HAI Project Nos. 2708 and 5237 DEQ ECSI File No. 84

SUBJECT: Alternative Grout Slurry for Borehole Abandonment and Seal for Permanent Groundwater Monitoring Wells, NW Natural Gasco Property, 7900 NW St, Helens Road and Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon

Dear Mr. Byrd:

Hahn and Associates, Inc. (HAI), on behalf of NW Natural, is requesting approval from the Oregon Water Resources Department (OWRD) for the use of a site-specific bentonite grout for soil boring abandonment work and well sealant for future groundwater monitoring or groundwater extraction wells installed as part of site investigation and cleanup activities at the above referenced contiguous properties (the Site).

NW Natural is conducting investigation and clean-up activities at the Site with oversight from the Oregon Department of Environmental Quality. The site has been impacted predominantly by polynuclear aromatic hydrocarbons, benzene, and cyanide. Trichloroethene and related degradation products have also been detected. Dissolved phase contamination and dense non aqueous phase liquid (DNAPL – a creosote-like oil with a density greater than water) are present at the Site.

As specified in OAR 690-240-0475, well seal material shall consist of a physically and chemically stable hydrated grout consisting of 1) neat cement; or 2) sodium bentonite; or 3) a cement-bentonite grout mixture containing no more than 5 percent bentonite by dry weight; or 4) sodium bentonite granules, pellets, or chips placed in an unhydrated state and subsequently hydrated downhole. OAR 690-240-0475 acknowledges that appropriate sealing materials may vary depending on site characteristics and substances being monitored.

As part of the pre-design process related to a pending source control action at the Site, Glynn Geotechnical Engineering has recently completed testing the compatibility and effectiveness of various bentonite and cement grout slurry sealing materials with contaminated groundwater and dense non aqueous phase liquids (DNAPL) obtained from the site. As provided within the attached letters of August 22 and 28, 2008 (Mark Glynn to Mike Crystal), it has been determined that a bentonite / Organoclay blend, consisting of approximately 9 parts Wyoming sodium bentonite and 1 part Organoclay by volume, and mixed to a 20% solids content, will be a superior sealant as compared to the sodium bentonite or cement bentonite grout slurries specified in OAR 690-240-0475.

The specific mixture that has been tested and recommended for use consists of granular CETCO Volclay CG-50 and PM-200 Organoclay. Technical data sheets for both of

these products are attached. A technical reference document is also attached that describes the applicability and function of Organoclay as a sealant in situations where high concentrations of organic contaminants are present. Please be advised that although the CG-50 product is not marketed by CETCO as a well seal material, the supplier has indicated that it is the same bentonite source that is marketed for differing uses under various names. An advantage to the CG-50 and PM-200 Organoclay mixture is that granular sizing of the two products is similar which better ensures a homogenous blend, and that CETGO can pre-mix and bag the 9:1 bentonite / Organoclay blend – thereby eliminating the need to prepare the proper blend in the field.

Testing by Glynn Geotechnical Engineering has determined that to achieve a slurry that is 20% solids (by volume), a single bag of the blend weighing 50 pounds should be mixed with 18.26 gallons of water. The solution should be blended with an electric paddle mixer. The resulting mud weight of the 20% solids solution will be 71.7 pounds per cubic foot (plus or minus 1 pound per cubic foot). The preceding equates to a mud weight of between approximately 9.5 to 9.7 pounds per gallon at a 20% solids content.

We are seeking approval from OWRD and DEQ to use the bentonite / Organoclay grout slurry mixture described above for those applications necessitating the use of a grout slurry sealant. All requirements concerning placement method and appropriate depth of placement within the borehole or well annulus, as well as verification of the appropriate mud weight, will remain as specified within OAR 690-240. Approval from the DEQ for use of the bentonite / Organoclay grout slurry described herein is being requested concurrently with this request to OWRD.

Should you have any questions, please contact the undersigned.

Sincerely.

Rob Ede, R.G.

Principal

robe@hahnenv.com

c: Mr. Bob Wyatt, NW Natural

Ms. Patty Dost, Schwabe, Williamson & Wyatt

Mr. Carl Stivers, Anchor Environmental, L.L.C.

Mr. John Edwards, Anchor Environmental, L.L.C.

Mr. Dana Bayuk, DEQ NW Region

Mr. Henning Larsen, DEQ NW Region

B. Ele

Mr. Tom Gainer, DEQ NW Region

Mr. Tom McCue, Siltronic Corporation

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SEP 29 2008

#### ATTACHMENT A

Glynn Geotechnical Engineering Documentation: Well Seal Evaluation and Recommendations

Correspondence dated: August 22, 2008 and August 29, 2008

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SEP 2 9 2008



August 22, 2008

Sevenson Environmental Services 2749 Lockport Road Niagara Falls, NY 14304

ATTN: Mr. Michael D. Crystal Vice President

SUBJECT:

Well Seal Evaluation

Gasco Site, Portland Oregon

GGE 05-1043C

Dear Mr. Crystal:

In response to your request I have reviewed the current issue regarding the failure of sealing materials in groundwater wells at the Gasco site. Based on substantive test data, it is my professional opinion that the bentonite/organo clay blend would be an effective replacement for plain bentonite grout in the construction of groundwater monitoring wells at the Gasco site.

By way of a few past projects, Glynn Geotechnical Engineering (GGE) has tested a recipe of bentonite and organo clay as a sealant against groundwater that contained significant DNAPL hydrocarbons. In each and every case the bentonite/organo clay blend, consisting of approximately 9 parts Wyoming bentonite and 1 part organo clay by volume, has demonstrated a compatibility with the groundwater at a permeability of less than 1.0E – 007 cm/sec. In general, the testing has indicated the permeability tends to decreases over time as result of continuing swell characteristics of the blend.

Within the past month a test of the compatibility/permeability of the blend was completed for the Gasco project. In this test the blend was tested against the site groundwater and effectively demonstrated that the bentonite/organo clay would be an effective seal for Sevenson's patented sheeting system.

In our tests we have used bentonite identified as CETCO and Volclay. Results of our tests indicate no remarkable differences in the results from the different bentonites. These results tend to substantiate the supplier claims that the same Wyoming bentonite is sold under different names. Therefore, my recommendation for the use of the bentonite/organo clay blend is made irrespective of the identifier for the bentonite. Specifically I would support the use of CETCO Pure Gold Grout for the bentonite portion of the blend.

Please do not hesitate to contact me with any questions or comments.

Sinceredy,

lark W. Glynn, P.E

Consulting Engineer, Principal Oregon: 80419 F.E.

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SEP 29 2008

415 South Transit Street, Lockport, New York 14094 volce 716.625.6933 / fax 716.625.6983 www.glynngroup.com

GLYNN GEOTECHNICAL ENGINEERING



August 29, 2008

Sevenson Environmental Services 2749 Lockport Road Niagara Falls, NY 14304

Attn: Mr. Michael D. Crystal

SUBJECT: Well Sea

Well Seal Material Standards Gasco Site, Portland Oregon

GGE 05-1043C

Dear Mr. Crystal:

On August 22, 2008 I sent you a letter regarding my evaluation of a bentonite/organo clay blend that would serve as a proper seal for monitoring wells at the Gasco Site. The proposed blend is comprised of 90% bentonite and 10% Organo Clay by volume.

To achieve a solution of 20% solids (by volume), a single bag of the blend weighing 50 pounds should be mixed with 18.26 gallons of water. The mud weight of the solution, as testing in the lab is 71.7 pcf. This unit weight was determined 15 minutes after the addition of water. The field measured unit weight should be expected to vary by no more than 1.0 pcf. We suggest that the solution be blended with an electric paddle mixer.

Please contact me directly if you need additional information.

8.29.08

Sincerely,

Mark W. Glynn, F.E.

Consulting Engineer, Principal

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#### ATTACHMENT B

Technical Data Sheets:

CETCO Volclay CG-50 and CETCO PM-200 Organoclay

# RECEIVED

SEP 29 2008



### Volclay ® CG-50

Description:	Volclay CG-50 is a natural, granular, high-swelling Wyoming sodium bentonite recommended for lining/sealing applications involving moist soils or those where it is necessary to minimize dust generation.									
Applications:	Soil/bentonite liners; general ser									
Composition:	Sodium bentonite is a hydrous silicate of alumina primarily consisting of the clay mineral montmorillonite, which swells several times its own volume when, wetted.									
Free Swell	24 ml/2g minimum (ACC 1010)	)								
Filtrate Loss:	18 ml maximum (API 13A)									
Moisture Content:	12 percent maximum as shipped	l								
Particle Sizing:		5 percent max. retained on a #10 mesh (2.00 mm) sieve 15 percent max. passing a #200 mesh (75 mm) sieve (ASTM D422)								
Dry Bulk Density:	65 lbs/ft <sup>3</sup> (1,040 kg/m <sup>3</sup> ) typical									
Packaging:	50 lb (22.5 kg) multi-wall paper kg) super sacks; or bulk.	bags; 2000-lb (900 kg) or 4,000 lb (1,800								
Availability:	F.O.B. Lovell, WY. Quantities l	ess than 1 ton may be available locally.								
Application Information:	Primary Soil Type Sand	Typical Application Rate*  8-10 lbs/ft² (40-50								
	Silt	4-8 lbs/ft <sup>2</sup> (20-50 kg/m <sup>2</sup> )								
	Clay 2-4 lbs/ft <sup>2</sup> (10-20 kg/m <sup>2</sup> )									
	*Application rates are for a soil/bentonite liner mixed in a layer 6 inches (150mm) in thickness with a permeability of 1 x 10 <sup>-7</sup> cm/sec. Application rates above are shown for informational purposes only. All soils should be tested to determine specific application rates.									

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SEP 29 2008

WATER RESOURCES DEPT SALEM, OREGON

Revised 3/03

1500 W. Shure Drive • Arlington Heights, IL 60004 • USA • (847) 392-5800 • FAX (847) 577-5571 /www.CETCO.com A wholly owned subsidiary of AMCOL International





# PM-200 ORGANOCLAY

MATERIAL PROPERTY	TEST METHOD	VALUE
Bulk Density Range	CETCO Test Method	44 – 56 lbs/ft <sup>3</sup>
Particle Size Distribution	US Standard Sieve Size	
	No.10 (Retained)	1% Maximum
	No.30 (Retained)	70% Minimum
	No.50 (Retained)	25% Maximum
	No.100 (Retained)	3% Maximum
	No.100 (Passing)	1% Maximum
Hydraulic Conductivity	ASTM D 5084 modified	1 x 10 <sup>-3</sup> cm/sec minimum
Oil Adsorption Capacity	CETCO Test Method	0.5 lb of oil per lb of Organoclay minimum
Quaternary Amine Content	CETCO Test Method	25 – 33% quaternary amine loading

A proprietary granular clay compound that reliably adsorbs oil and similar organics from water.

Packaging - 1,500 lb. supersacks (with approximately 22-24 tons per flatbed truck).

Rev. 3 - 8/8/07



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SEP 29 2008

WATER RESOURCES DEPT
66 SALEM OREGON

1500 West Shure Drive 5th Floor, Arlington Heights, IL 60004 USA 800.527.9948 Fax 847.577.5566

For the most up-to-date product information please visit our website, <a href="www.sedimentremediation.com">www.sedimentremediation.com</a>
A wholly owned subsidiary of AMCOL International Corporation

The information and data contained herein are believed to be accurate and reliable, CETCO makes no warranty of any kind and accepts no responsibility for the results obtained through application of this information.

#### ATTACHMENT C

**CETCO Technical Reference** 

Organoclay Media as a Sealant Additive

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SEP 29 2008



#### REMEDIATION TECHNOLOGIES

Technical Reference

# UTILIZING ORGANOCLAY<sup>TM</sup> MEDIA AS A SORBENT RECEIVED ADDITIVE TO DECREASE ORGANIC MOBILITY AND SEP 2 9 2008 HYDRAULIC CONDUCTIVITY WATER RESOURCES DE

WATER RESOURCES DEPT SALEM, OREGON

#### BACKGROUND

Organic contaminants migrating with groundwater sources continue to offer significant challenges in terrestrial remediation applications. While selective media such as granular activated carbon (GAC) have proven to be successful at adsorbing soluble organics, these media may have reduced performance due

to blinding in the presence of high molecular weight organic matter and may be prematurely saturated due to the active sites competing for inorganic matter as well as the organic contaminants of concern. An alternative technology is emerging that addresses this problem with a clay-based adsorption media, which effectively and efficiently stabilizes low-soluble organic matter. Organoclay<sup>TM</sup> Media utilizes granular sodium bentonite clay, which has been chemically modified to attract organic matter without absorbing water. The unique platelet structure of bentonite provides tremendous surface area and the capacity of the media to adsorb over 60 percent (by weight) in organic matter.

Organoclays have been utilized as additives to permeable reactive barriers (PRB), amendments to soil liners and as a soil stabilization agent to reduce the transport of organic contaminants. The primary focus has been on the ability for this specialty sorbent to effectively adsorb low soluble organic matter from aqueous solutions. Organoclay has been also been used as an additive to soil containment barriers and low permeable slurry walls. It has been shown to reduce transport of organic contaminants and improve the hydraulic conductivity characteristics when petroleum based hydrocarbons are present. (Boldt-Leppin, Haug and Headley, 1996).

#### APPLICABILITY AS A SOIL SEALANT

Sodium bentonite clay has been utilized as soil admix for hydraulic barriers for a variety of remedial applications. The primary benefit of utilizing this specialty mineral is the fact that it is very hydrophilic and swells many times (by volume) in the presence of fresh water. The result is a barrier of very low hydraulic conductivity (< 10<sup>-9</sup> m/s typical). The design of these barrier systems has focused on minimizing the flow of water. However, even with hydraulic conductivities of less than 10<sup>-7</sup> cm/s, the mass flux of many organic contaminants can be significant. While bentonite clay is able to minimize the advective flow of suspended contaminants, transport due to molecular diffusion can be a critical transport mechanism (Lake and Rowe, 2000, 2004). The inability of typical clays to impede diffusive transport has lead to new research on utilizing Organoclay and other specialty sorbents to amend standard bentonite-soil barriers. Recent studies have shown that hydraulic conductivity of sodium bentonite and earthen barriers amended with 3% (by weight) of certain types of Organoclay met or surpassed regulatory requirements of 1x10<sup>-7</sup> cm/s. More importantly, transport simulations indicated that these modified barriers can retard benzene transport. (Hunt, Smith, Burns and Rabideau, 2005).

#### **APPLICABILITY IN SOIL-BENTONITE SLURRY WALLS**

Slurry walls are physical barriers used to contain or direct the flow of groundwater. Most slurry walls are constructed of native soils, bentonite clay and water mixture. Portland cement and other self

TR 828 1/2007



#### REMEDIATION TECHNOLOGIES

Technical Reference

hardening components are also often used if the design requires lower permeability (< 10<sup>-7</sup> cm/s) or higher compressive strength. While these engineered barriers have long been used in construction applications to control seepage, they continue to gain popularity in remedial applications for the containment and redirection of contaminated groundwater. When constructing slurry walls, permeability is the critical parameter for designers and regulators. However, incompatibilities between traditional construction materials and site contaminants (if they are organic in nature) have lead to the development of new compositions of traditional soil-bentonite slurry walls. These new designs include specialty sorbents to more effectively contain shorter chain hydrocarbons and other organic matter that may be capable of passing through barriers with permeability as low as 10<sup>-7</sup> cm/s. When mixed in to a standard slurry wall mix at a 2% (by weight) addition rate, Organoclay has proven to effectively minimize the migration of medium to light hydrocarbons previously passing through the barrier. Furthermore, within 14 days the perm value of the amended slurry wall was almost an order of magnitude lower than the standard bentonite formulation.

#### **APPLICABILITY AS A SPECIALTY GROUT**

Sheet piling consists of a series of panels with interlocking connections, driven into the ground to form an impermeable barrier. These panels can be constructed from a variety of materials such as steel, vinyl and plastic depending on the site specific contaminants present. While these specialty engineered barriers have proven to be impervious to aqueous solutions and migrating organic matter, they are sometimes susceptible to these solutions passing through the interlocking joints if not installed and sealed properly. A new specialty grout incorporating Organoclay and high swelling sodium bentonite clay has proven successful in creating an impermeable seal in the open cavities within these joints. Furthermore, the addition of Organoclay to this grout ensures that organic material migrating with these solutions will not pass beyond the piling. Grouts of this type may be used to seal known areas of high infiltration or permeable formations.

#### SUMMARY

Terrestrial remediation projects for organic contaminants pose many challenges for traditional technologies. Organoclay amendments to PRBs, soil liners, GCLs, slurry walls and grouts may be used to improve their performance preventing migration of these organic contaminants in both permeable and impermeable engineered barriers. Because individual site characteristics vary, project specific testing should be conducted to determine applicability.

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WATER RESOURCES DEPT SALEM, OREGON

> TR 828 1/2007



2001 NW 19th Avenue, Suite 200 | Portland, OR 97209 | 971 544-2139 | www.maulfoster.com

November 7, 2014 Project No. 8128.01.08

Mr. Dana Bayuk Oregon Department of Environmental Quality 2020 SW 4th Avenue Portland, Oregon 97201-4987

Rc: Final Revised Monitoring Wells WS-11 and WS-14 Abandonment Plan Siltronic Corporation 7200 NW Front Avenue, Portland, OR ECSI No. 183

#### Dear Dana:

On behalf of Siltronic Corporation (Siltronic), Maul Foster & Alongi, Inc. (MFA) has prepared this letter in response to direction from the Oregon Department of Environmental Quality (DEQ) to abandon nested monitoring well pairs WS-11 and WS-14 on the Siltronic property. Direction to abandon WS-14 was provided in DEQ's January 28, 2014 e-mail correspondence to Siltronic documenting a January 27, 2014 telephone conversation.

The initial version of this work plan was submitted to DEQ on February 14, 2014 to which DEQ responded in an email dated April 10, 2014. DEQ's April 10th email informed Siltronic that there were insufficient details regarding the well abandonment procedures and provided their approval to proceed with the well inspection video logging for WS-14-125/161 to support scoping and planning of the abandonment work. The video log inspection of the WS-14 monitoring well pair was submitted to DEQ on April 25, 2014. DEQ responded with comments in an email dated June 25, 2014. MFA incorporated DEQ comments and submitted a revised work plan on July 25, 2014. On September 18, 2014, DEQ responded with comments in a letter Abandonment of the WS-11 and WS-14 Monitoring Well Clusters and Installation of a Deep Monitoring Well and requested that a revised work plan be submitted to DEQ by October 6, 2014. To expedite DEQ's review, MFA provided a draft of the revised text to DEQ on October 6th prior to the final document being produced. DEQ responded in a letter on October 22<sup>nd</sup> with their approval of the final document and implementation subject to incorporating their comments. This Final Revised Monitoring Wells WS-11 and WS-14 Abandonment Plan is a revision of previous versions and incorporates DEQ's September 18th and October 22nd comments; a separate submittal will be provided addressing DEQ's September 18th request for a replacement monitoring well. For reference, DEQ correspondence is included in Attachment A.

#### BACKGROUND

The nested monitoring well pairs WS-14 and WS-11 are located near the north PECEIVED northwest) corner of the Siltronic property as shown in the attached figure. The wells were

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completed in October 2003 (WS-11) and July 2004 (WS-14) and constructed in accordance with then-approved DEQ and Oregon Water Resources Department (OWRD) design specifications of 2-inch diameter, flush threaded, Schedule 40 polyvinyl chloride (PVC) riser pipe; and 2-inch diameter, stainless steel wire wrapped 0.010-inch slot screen; and 2-inch diameter stainless steel sump.

Monitoring well WS-11-125 was completed to 125 feet below ground surface (bgs) and monitoring well WS-11-161 was completed to 161 feet bgs, the same completion depths correlate with WS-14-125 and WS-14-161, respectively. The screened interval is 15 feet in primarily silt and sand for all four wells with a 1 foot sump at the bottom. The monitoring well construction logs are included in Attachment B.

The monitoring well pair WS-11 is identified by OWRD as well log ID "MULT 72126". For monitoring well pair WS-14, the OWRD log "MULT 73686" reports the well number as WS-13, but the reported well number appears to be incorrect. The correct OWRD well log file for WS-14 is "MULT 73686." The OWRD well logs are included in Attachment C.

Per DEQ direction in their email dated January 28, 2014, a video inspection of the inside of monitoring wells WS-14-125 and WS-14-161 was completed to identify the potential causes for the presence of manufactured gas plant (MGP) dense, non-aqueous phase liquid (DNAPL) in WS-14-161. The video logs were submitted to DEQ on April 25, 2014 for review showing the joints in the WS-14 well pair to be intact. At that time, only the WS-14 well pair was scheduled to be abandoned. In the DEQ email dated June 25, 2014, DEQ directed Siltronic to also abandon well pair WS-11-125 and WS-11-161.

#### MONITORING WELL DECOMMISSIONING

Public and private utility-locating services and other information sources will be used to check for underground utilities before work begins. MFA will coordinate fieldwork to locate possible on-site utilities and piping or other subsurface obstructions. Prior to overdrilling, an air knife will be used to 10 feet bgs around the wells to verify clearance from potential subsurface obstructions. For reference, site features near WS-11 and WS-14, including known utility lines and monitoring wells, are shown on the attached figure.

The monitoring well abandonment will be conducted in accordance with applicable regulations including Oregon Administrative Record (OAR) 690-240-0510, DEQ Guidance Document titled Groundwater Monitoring Well Drilling, Construction, and Decommissioning<sup>1</sup>, and previously approved protocols for abandoning monitoring wells at the NW Natural and Siltronic sites including an OWRD variance to use bentonite or organoclay/bentonite slurry if MGP DNAPL is encountered.

The abandonment procedures will include, but not be limited to, the following:

DEQ. 1992. Groundwater Monitoring Well Drilling, Construction, and Decommissioning. Technic CEIVED Guidance. Oregon Department of Environmental Quality. August 24.

- Measuring the depth to water and depth to bottom of the monitoring well
- Checking for the presence of MGP DNAPL and measuring its depth and thickness in each of the four monitoring wells, where present DNAPL will be removed to the maximum extent practicable before well abandonment work is initiated
- Using a sonic drilling rig, overdrilling the 2-inch-diameter PVC/steel monitoring wells to the depth necessary to confirm the removal of well construction materials:
  - o A 10-inch casing will be used from ground surface to a minimum of 5-feet below the bottom of the sand pack (approximately 130 feet bgs) at monitoring wells WS-11-125 and WS-14-125. Advancement of the 10-inch casing may continue depending on observations made in the field of the material from this depth, then
  - o An 8-inch casing will be used to remove the remaining well construction materials to the bottom of the borehole.
- The WS-14 monitoring well cluster will be overdrilled to minimum depth of 15-feet below the bottom of the filter pack for WS-14-161. The material retrieved from below the bottom of the filter pack will be visually inspected for evidence of DNAPL. If evidence of DNAPL is observed then the boring will be advanced ten additional feet and the material from the bottom of the borehole will be inspected for evidence of DNAPL. This process will be repeated until no evidence of DNAPL is observed at which time borehole sealing will proceed.
- Unless DNAPL is detected in monitoring well WS-11-161, the WS-11 monitoring
  well cluster will be overdrilled to a minimum of 5-feet below the bottom of the filter
  pack for WS-11-161 to ensure the complete removal of casing, screen, and sand from
  the borehole. In the event DNAPL is detected in WS-11-161 Siltronic will follow the
  overdrilling procedure for the WS-14 monitoring well cluster.
- Consistent with site-specific requirements for preparation and use (i.e., OWRD-approved variance), organoclay-bentonite sealant will be used throughout the depth intervals where available information (e.g., boring logs, TarGOST® logs, observations made during abandonment work) provides evidence of DNAPL occurrence.
- Use of the organoclay-bentonite mix will be documented in detail. Documentation should include but is not limited to, Siltronic providing the basis for identifying the depth interval(s) where the organoclay-bentonite sealant was used; mud-weight measurements for each volume of slurry mixed and pumped downhole; the total volume of slurry used; and the estimated depth of slurry placement.
- The remaining portions of the borehole will be sealed using materials consistent with the requirements of OAR 690-240-510
- Surface completion to match the surrounding area

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 Monitoring well construction materials, soil, decontamination liquid and groundwater generated during the well abandonment will be contained and staged on-site. Well abandonment materials will be characterized and managed consistent with the procedures established for investigation derived waste generated within the TCE Contaminated Material Management Area.

#### REPORTING

MFA will submit a report to DEQ documenting the abandonment work within 45 days of completing the fieldwork.

#### **SCHEDULE**

MFA is prepared to begin work upon DEQ review and approval of the proposed approach, subject to availability of subcontractors.

Sincerely,

Maul Foster & Alongi, Inc.

Kerry-Cathlin Gallagher

Project Scientist

James G.D. Peale, RG Principal Hydrogeologist

Attachment: Figure

Attachment A—DEQ Correspondence

Attachment B-Monitoring Well Completion Logs

Attachment C-OWRD Well Logs

cc: Myron Burr, Siltronic Corporation

Alan Gladstone, Davis Rothwell Earle & Xochihua, P.C.

Ilcne Gaekwad, Davis Rothwell Earle & Xochihua, P.C.

William Earle, Davis Rothwell Earle & Xochihua, P.C.

Chris Reive, Jordan Ramis

Keith Johnson, DEQ

Tom Gainer, DEQ

Henning Larsen, DEQ

Kristopher Byrd, OWRD

Sean Sheldrake, EPA

Rich Muza, EPA

Lance Peterson, CDM Smith

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Mr. Dana Bayuk November 7, 2014 Page 5 Project No. 8128.01.08

Scott Coffey, CDM Smith Bob Wyatt, NW Natural Patty Dost, Pearl Legal Group, LLC John Edwards, Anchor QEA, LLC John Renda, Anchor QEA, LLC Rob Ede, Hahn and Associates, Inc.

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# **FIGURE**

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#### Legend

- NW Natural Station
- Siltronic Monitoring Well
- TarGOST Boring
- Utility Line (Siltronic) Siltronic Tax Lot

Figure
Monitoring Well WS-14
and WS-11 Locations

Siltronic Corporation Portland, Oregon





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# ATTACHMENT A

DEQ CORRESPONDENCE



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#### **Department of Environmental Quality**

Northwest Region Portland Office 2020 SW 4<sup>th</sup> Avenue, Suite 400 Portland, OR 97201-4987 (503) 229-5263 FAX (503) 229-6945 TTY (503) 229-5471

September 18, 2014

Also Sent Via E-mail

Mr. Myron Burr Siltronic Corporation 7200 Front Avenue, M/S 30 Portland, OR 97210-3676

Re: Abandonment of the WS-11 and WS-14 Monitoring Well Clusters and Installation of a Deep Monitoring Well Siltronic Corporation Facility Portland, Oregon ECSI No. 183

Dear Mr. Burr:

The Oregon Department of Environmental Quality (DEQ) reviewed the "Revised Monitoring Wells WS-11 and WS-14 Abandonment Plan - Siltronic Corporation, 7200 NW Front Avenue, Portland, OR – ECSI No. 183" dated July 25, 2014 (Revised Abandonment Plan). The Revised Abandonment Plan provides the approach Siltronic Corporation (Siltronic) proposes using to abandon the WS-11 and WS-14 nested double-completion monitoring well clusters. Maul Foster and Alongi, Inc. (MFA) prepared the Revised Abandonment Plan on behalf of Siltronic.

The primary purpose of this letter is to inform Siltronic that DEQ:

- Approves the Revised Abandonment Plan subject to the document being revised as indicated in this letter; and
- Requires a monitoring well to be drilled and constructed in the vicinity of the WS-11 cluster to replace the two deep installations being abandoned.

DEQ's condition for approving the Revised Abandonment Plan and additional information regarding drilling and installing the deep monitoring well are provided below.

#### Abandonment of the WS-11 and WS-14 Monitoring Well Clusters

DEQ approves the Revised Abandonment Plan subject to the condition that the document be revised to include the following steps:

- In addition, to checking for the presence of dense non-aqueous phase liquid (DNAPL) and
  measuring its thickness in each of the four monitoring wells, where present DNAPL will be
  removed to the maximum extent practicable before abandonment work is initiated.
- Unless DNAPL is detected in monitoring well WS-11-161, the WS-11 monitoring well cluster will be overdrilled to a minimum of 5-feet below the bottom of the filter pack for WS-11-161 to ensure the complete removal of casing, screen, and sand from the borehole. In the event DNAPL is detected in WS-11-161 Siltronic will follow the overdrilling procedure by ED

Mr. Myron Burr Siltronic Corporation September 18, 2014 Page 2 of 3

the WS-14 monitoring well cluster.

- The WS-14 monitoring well cluster will be overdrilled to a minimum depth of 15-feet below the bottom of the filter pack for WS-14-161. The material retrieved from below the bottom of the filter pack will be visually inspected for evidence of DNAPL. Absent visual evidence of DNAPL, sealing of the borehole will proceed. If evidence of DNAPL is observed then the boring will be advanced ten additional feet and the material from the bottom of the borehole will be inspected for evidence of DNAPL. This process should be repeated until no evidence of DNAPL is observed at which time borehole sealing will proceed.
- Consistent with site-specific requirements for preparation and use, organoclay-bentonite sealant will be used throughout the depth intervals where available information (e.g., boring logs, TarGOST® logs, observations made during abandonment work) provides evidence of DNAPL occurrence.
- Use of the organoclay-bentonite mix will be documented in detail. Documentation should
  include but is not limited to, Siltronic providing the basis for identifying the depth interval(s)
  where the organoclay-bentonite sealant was used; mud-weight measurements for each
  volume of slurry mixed and pumped downhole; the total volume of slurry used; and the
  estimated depth of slurry placement.
- The remaining portions of the borehole should be sealed using materials consistent with the requirements of OAR 690-240-510.
- Well abandonment materials will be characterized and managed consistent with the procedures established for investigation derived waste generated within the TCE Contaminated Material Management Area.
- Siltronic will submit the report documenting abandonment work within 45-days of completing work in the field.

The Revised Abandonment Plan should be revised to include the information indicated above and submitted to DEQ on or before October 6, 2014.

#### Replacement Monitoring Well Drilling and Installation

DEQ requires that Siltronic drill and install a deep monitoring well in the vicinity of the WS-11 monitoring well cluster to replace the two deep installations being abandoned. The replacement well will be used to monitor groundwater levels and chemistry in the deep Lower Alluvium WBZ beneath the "deep aquitard." The data from the installation will be used to further evaluate water level differences between the upper Lower Alluvium water-bearing zone (WBZ) and deep Lower Alluvium WBZ, and groundwater chemistry in the deep Lower Alluvium WBZ. The monitoring well will also be incorporated into Alluvium WBZ hydraulic control and containment system performance monitoring program.

The replacement monitoring well should be constructed in a separate borehole from the WS-11 double-completion installation. The replacement monitoring well should be drilled to a depth that ensures that the top of the filter pack is below the bottom of the deep aquitard. Before field work begins, Siltronic should submit a work plan for drilling and installing the monitoring well EIVED for DEQ's review and approval. The plan should include information regarding the proposed JAN 2 3 2015

Mr. Myron Burr Siltronic Corporation September 18, 2014 Page 3 of 3

location, projected depth and basis, drilling methodology, and construction methodology and materials. DEQ requests that Siltronic submit the deep monitoring well drilling and installation plan for our review on or before October 20, 2014.

Please contact me with questions regarding this letter.

Sincerely,

#### Dana Bayuk

Cc: Alan Gladstone, Davis Rothwell Earle and Xochihua Bill Earle, Davis Rothwell Earle and Xochihua Chris Reive, Jordan Ramis James Peale, MFA Kerry Gallagher, MFA Bob Wyatt, NW Natural Patty Dost, Pearl Legal Group John Edwards, Anchor QEA, LLC John Renda, Anchor QEA, LLC Rob Ede, Hahn & Associates, Inc. Sean Sheldrake, EPA Rich Muza, EPA Lance Peterson, CDM Smith Scott Coffey, CDM Smith Kris Byrd, Oregon Water Resources Department Keith Johnson, NWR/C&SA Tom Gainer, NWR/C&T Henning Larsen, NWR/C&T ECSI No. 183 File

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Department of Environmental Quality

Northwest Region Portland Office 2020 SW 4<sup>th</sup> Avenue, Suite 400 Portland, OR 97201-4987 (503) 229-5263 FAX (503) 229-6945 TTY (503) 229-5471

October 22, 2014

Also Sent Via E-mail

Mr. Myron Burr Siltronic Corporation 7200 Front Avenue, M/S 30 Portland, OR 97210-3676

Re: Abandonment of the WS-11 and WS-14 Monitoring Well Clusters - Siltronic Corporation

Facility

Portland, Oregon ECSI No. 183

Dear Mr. Burr:

The Oregon Department of Environmental Quality (DEQ) reviewed the "Final Revised Monitoring Wells WS-11 and WS-14 Abandonment Plan – Siltronic Corporation, 7200 NW Front Avenue, Portland, OR – ECSI 183" dated October 6, 2014 (Final Revised Abandonment Plan). The Final Revised Abandonment Plan presents the approach Siltronic will be using to abandon the WS-11 and WS-14 nested double-completion monitoring well clusters. Maul Foster and Alongi, Inc. (MFA) prepared the Final Revised Abandonment Plan for Siltronic Corporation (Siltronic) based on DEQ's September 18, 2014 comments on the Revised Abandonment Plan.

The primary purpose of this letter is to inform Siltronic that based on our review, DEQ:

- Acknowledges the Final Revised Abandonment Plan has been revised consistent with our September 18<sup>th</sup> comments letter; and
- Approves the Final Revised Abandonment Plan for finalization and implementation subject to the document being revised as follows:
  - The first paragraph summarizes correspondence related to the abandonment of the WS-11 and WS-14 monitoring well clusters. The paragraph is missing a reference to DEQ's April 10, 2014 e-mail: 1) informing Siltronic that the Draft Abandonment Plan² lacked details regarding well abandonment procedures; and 2) approving video logging of the monitoring wells in the WS-14 cluster to support scoping and planning of the abandonment work.
  - The Final Revised Abandonment Plan removes references to the use of 10-inch and 8-inch casing for overdrilling the WS-11 and WS-14 monitoring well clusters. DEQ understands from telephone conversations with MFA that these casing sizes will be used. DEQ further understands that the 10-inch casing will be advanced to a minimum of 5-feet below the bottom of the sand pack at monitoring wells WS-11-125 and WS-14-125. Advancement of the 10-inch casing may continue depending on observations made in the field of the material from this

<sup>2</sup> MFA, 2014, "Monitoring Well WS-14 Abandonment Plan, Siltronic Corporation, 7200 NW Front Avenue, For ED ECSI No. 183," February 14, a work plan prepared on behalf of Siltronic Corporation.

<sup>&</sup>lt;sup>1</sup> MFA, 2014, "Revised Monitoring Wells WS-11 and WS-14 Abandonment Plan – Siltronic Corporation, 7200 NW Front Avenue, Portland, OR – ECSI 183," July 25, a work plan prepared for Siltronic Corporation.

Myron Burr Siltronic Corporation October 22, 2014 Page 2 of 2

depth. The 8-inch casing will be used to remove well construction materials to the bottom of the borehole consistent with the procedures identified in the abandonment plan. This information should be incorporated into the Final Abandonment Plan.

DEQ requests that Siltronic incorporate the final changes indicated above and submit the Final Abandonment Plan on or before November 7, 2014.

Please don't hesitate to contact me with questions regarding this letter.

Sincerely,

Dana Bayuk Project Manager Cleanup and Site Assessment Section

Cc: Alan Gladstone, Davis Rothwell Earle and Xochihua Bill Earle, Davis Rothwell Earle and Xochihua llene Gaekwad, Davis Rothwell Earle and Xochihua Chris Reive, Jordan Ramis James Peale, MFA Kerry Gallagher, MFA Bob Wyatt, NW Natural Patty Dost, Pearl Legal Group Ben Hung, Anchor QEA, LLC John Edwards, Anchor QEA, LLC John Renda, Anchor QEA, LLC Rob Ede, Hahn & Associates, Inc. Sean Sheldrake, EPA Rich Muza, EPA Lance Peterson, CDM Smith Scott Coffey, CDM Smith Kris Byrd, Oregon Water Resources Department Keith Johnson, NWR/C&SA Tom Gainer, NWR/C&T Henning Larsen, NWR/C&T ECSI No. 183 File

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# ATTACHMENT B

MONITORING WELL COMPLETION LOGS



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Pripar Location Professional Composition Table National Composition Table N	Ma	ul Foster &	Alongi, I	nc.	Project I	Vumb	er	Borehole Log/Well Const	Sheet 1 of 11
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PID = 0.0	Depth (feet, BGS		Interval Percent Recovery	Coffection		Blows/8"	Lithologic Column		
120 to 16.0 teet: WOOD; core of wood; starning at upper end of wood; naphthalene or petroleum like odor. (Fill)  160 to 17.0 feet: SAND (SP); dark brown; 100% sand, fine to medium; trace fines and gravels; moist. Possibly drilling sluff from trying to clean out the hole from the wood. (Fill)  17.0 to 18.0 feet: WOOD; core of wood; staining at upper end of wood; naphthalene or petroleum like odor. (Fill)  180 to 19.0 feet: SAND (SP); light brown, moist; 100% sand, fine to medium; trace fines and gravels; moist. (Fill)  19.0 to 21.0 feet: SAND (SP); light gray; 50% fines, non plastic; 50% sand, fine to medium; dry. Britile, breeks apart in fleles. (Fill)  NOTES: 1. CB=466-inch core barrel sol sampler. 2. PID = Photo ionization detector, sol head space reading in parts per million. 3. GW= groundweler sample, dashed graphic indicates approximate screened interval. 4. bps = below ground surface. 5. PVC = poly virty chloride.			100%	CB	PID = 0.0			non plastic; 30% gravel, medium, subar modlets, woody debris; moist 0.5 to 1.5 feet SANDY GRAVEL (GP); bro medium; 60% gravel, fing, subangular i 1.5 to 7.0 feet SAND (SP); fight brown; 95;	ngular, 50% organic debris, whish-gray, 40% sand, fine to b subrounded: dry. (Fill)
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120 to 16.0 leef: WCCD; core of wood; starring at upper end of wood; naphthalene or petrolaum like odor. (Fill)  160 to 17.0 feet: SAND (SP); derk brown; 100% sand, fine to medium; trace fines and gravels; moist. Possibly chilling sluff from trying to clean out the hole from the wood. (Fill)  17.0 to 18.0 feet: WCCD; core of wood; staining at upper end of wood; naphthalene or petrolaum like odor. (Fill)  17.0 to 18.0 feet: WCCD; core of wood; staining at upper end of wood; naphthalene or petrolaum like odor. (Fill)  18.0 to 19.0 feet: SAND (SP); light brown, most; 100% sand, fine to medium; trace fines and gravels; moist. (Fill)  19.0 to 21.0 feet: SANDY SILT (ML-SM); light gray; 50% fines, non plastic; 50% sand, fine to medium; dry. Britile, breaks apart in flerkes. (Fill)  19.0 to 21.0 feet: SANDY SILT (ML-SM); light gray; 50% fines, non plastic; 50% sand, fine to medium; dry. Britile, breaks apart in flerkes. (Fill)		50 50 50 50 50 50 50 50 50 50 50 50 50 5			PID = 0.0				
120 to 16.0 test: WCCD; core of wood; staining at upper end of wood; naphthalene or petrolaum like odor. (Fill)  160 to 17.0 feet: SAND (SP); derk brown; 100% sand, fine to medium; trace fines and gravels; moist. Possibly chilling sluff from trying to clean out the hole from the wood. (Fill)  17.0 to 18.0 feet: WCCD; core of wood; staining at upper end of wood; naphthalene or petrolaum like odor. (Fill)  17.0 to 18.0 feet: WCCD; core of wood; staining at upper end of wood; naphthalene or petrolaum like odor. (Fill)  18.0 to 19.0 feet: SAND (SP); light brown, most; 100% sand, fine to medium; trace fines and gravels; moist. (Fill)  19.0 to 21.0 feet: SAND (SP); light brown, most; 100% sand, fine to medium; trace fines and gravels; moist. (Fill)  19.0 to 21.0 feet: SAND (SP); light brown, most; 100% sand, fine to medium; trace fines and gravels; moist. (Fill)  19.0 to 21.0 feet: SAND (SP); light brown, most; 100% sand, fine to medium; trace fines and gravels; moist. (Fill)	8		¯ 100%	СВ	PID = 0.0				00% sand, fine to medium; trace
120 to 16.0 leef: WCCD; core of wood; starring at upper end of wood; naphthalene or petrolaum like odor. (Fill)  160 to 17.0 feet: SAND (SP); derk brown; 100% sand, fine to medium; trace fines and gravels; moist. Possibly chilling sluff from trying to clean out the hole from the wood. (Fill)  17.0 to 18.0 feet: WCCD; core of wood; staining at upper end of wood; naphthalene or petrolaum like odor. (Fill)  17.0 to 18.0 feet: WCCD; core of wood; staining at upper end of wood; naphthalene or petrolaum like odor. (Fill)  18.0 to 19.0 feet: SAND (SP); light brown, most; 100% sand, fine to medium; trace fines and gravels; moist. (Fill)  19.0 to 21.0 feet: SAND (SP); light brown, most; 100% sand, fine to medium; trace fines and gravels; moist. (Fill)  19.0 to 21.0 feet: SAND (SP); light brown, breaks apart in flekes. (Fill)  19.0 to 21.0 feet: SAND (SP); light brown, breaks apart in flekes. (Fill)  19.0 to 21.0 feet: SAND (SP); light brown, breaks apart in flekes. (Fill)  19.0 to 21.0 feet: SAND (SP); light brown, breaks apart in flekes. (Fill)	11				PID = 0.0				
IOTES: 1. C8 = 4x6-inch core barrel soil sampler: 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened intervel. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.	13	BOOL BOOK BOOK			PID = 0.0			12.0 to 16.0 feet: WOOD; core of wood; sit naphthalene or petroleum like odor. (Fi	aining at upper end of wood;
IOTES: 1. C8 = 4x6-inch core barrel soil sampler: 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly viryl chloride.					PID = 0.0				
IOTES: 1. C8 = 4x6-inch core barrel soil sampler: 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly viryl chloride.								fines and gravels; moist. Possibly drilli the hole from the wood. (Fill) 17.0 to 18.0 feet. WOOD; core of wood; si naphthalene or petroleum like odor. (Fi	ng sluff from trying to clean out aining at upper end of wood; iil)
VOTES: 1. CB = 4x6-inch core barrel soil sampler: 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened Interval. 4. bgs = below ground surface. 5. PVC = poly viryl chloride.	19		100%	СВ	PID = 0.0		T I I	trace fines and gravels; moist. (Fill)  19.0 to 21.0 feet: SANDY SILT (ML-SM); i	ight gray; 50% fines, non plastic;
screened interval. 4. bgs = below ground surface. 5. PVC = poly viryl chloride.	20		8		PID ≈ 0.0			50% sand, fine to medium; dry. Brittle,	breaks apart in flakes. (Fil)
Appropriests water lavel absenced JAN 2.3	VOTE							eading in parts per million. 3. GW = groundweller sampli	

Maul Foster & Alongi, Inc.							Project I 8128.			Well Number WS-11	Sheet 2 of 11
(S)		Well	Т			ample L		77.00		Soil Description	2 0/ 1/
Depth (feet, BGS)		Details	Interval	Percent Recovery	Collection	Number	Name (Type)	Blows/8"	Lithologic		
21		Ž					PID = 0.0			21.0 to 270 feet: SAND (SP); reddish-brown gravel, fine to medium, subrounded; dry	i; 90% sand, fine to medium; 10% to moist. (Fill)
23							PID = 0.0 PID = 0.0			@ 22.5 feet 0.2-foot layer color change to steel shackle from a padlock	light gray. Steel debris, possibly
24							PID = 0.0				
25 26											
27				90%	CB		PID = 0.0			27.0 to 28.0 feet. NO RECOVERY.	
28 29		Ž	7							28.0 to 31 5 feet: SAND (SP); dark gray; 95 gravels, subrounded; wet. (Fill)	% sand, fine to medium; 5%
30							PID = 0.0				
31											
32							PID = 13.5			31.5 to 370 feet: SILTY SAND to SANDY 3 fines, non plastic; 50% sand, fine; orga  (0) 31.5 feet: 0.2-foot thick layer of staining.	nic debris, roots; moist to wet.
33							PID = 7.0			,	
35 36	DOM DO						PID = 0.0				
37				90%	СВ		PID = 0.0			37.0 to 38.0 feet: NO RECOVERY.	
38										38.0 to 41.0 feet: SANDY SILT (ML); dark a sand, fine; organic debris, wood, roots;	gray, 60% fines, non plastic, 40% wat.
40							PID = 0.0				
41										41.0 to 47 0 feet: SILTY SAND (SM); dark sand, fine to medium, organic debris, ro petroleum-like odor:	
NOTE	100 10	g 1999	h core ba	arrel soil se	mpler 2	PID=F	Photo ionization de	elector, s	oil head space	reading in parts per million. 3. GW = groundwater sample	RECEN  deshed graphic indicates approximate
	SCT		1. 4. bg:	s = below	ground s	urfaca. 5	i PVC = poly vin				JAN 23

Maul Foster &	Alongi, Inc.	Project N		Borehole Log/Well Constr Wel Number	Sheet
		8128.0		WS-11	3 of 11
(Seeth Details Details	Interval Percent Recovery Collection Method	Sarriple Data	Blows/6" Lithologic Calumn	Soil Description	
43					
44					
45		PID = 0.0			
46					
48	100% CB	PID = 0.0		47.0 to 50.0 feet: SILTY SAND (SM); dark y sand, fine to medium; micaceous; organ	gray, 40% fines, non plastic, 60% ic debris; wet
49					
50 51		PID = 0.0		50.0 to 53.5 feet. SAND with SILT (SP-SM), plastic; 85% sand, fine to medium; mica	; dark gray, 15% fines, non ceous, wet
52		PID = 0.0			
53					
43 44 45 46 47 48 49 50 51 52 53 54 55 56 57		PID = 0.0		53.5 to 54.0 feet: SILT (ML); dark gray, 95% 5% sand, fine; sand in pockets; micace 54.0 to 57.0 feet: SAND with SILT (SP-SM) plastic; 85% sand, fine to medium; mica	p <u>us: organic dabris.</u> ; dark gray; 15% fines, non
IDDI IDDI IDDI	100% CB	PID = 0.0		57.0 to 58.0 feet: SILTY SAND (SM); dark sand, fine to medium; micaceous; organ	ic debris; wet
59		PID = 0.0		58.0 to 59.0 feet: SILT (ML); dark gray, 100 fine sand in pockets; micaoeous; organ 59.0 to 60.0 feet: SAND with SILT (SP-SM) plastic; 85% sand, fine to medium; mica	ic debris, roots; wet. ; dark gray; 15% fines, non
58 59 60 61 62 63 64		PID = 0.0		plastic; 65% sand, tine to medium; mica 60.0 to 64.0 feet: SiLTY SAND (SM); dark sand, fine to medium, micaceous; organ	gray; 20% fines, non plastic; 80;
62	100% CB	PID = 0.0			
63 64		PID = 0.0			
				64.0 to 67.0 feet: SAND (SP); derk gray; 59. fine to medium; micaceous, coarse mice	fakes VRECEIVE
NOTES: 1. CB = 4x6-inc screened interve	th core barrel soil sampler. ; al. 4. bgs = below ground .	2. PID = Photo ionization de surface. 5. PVC = poly virg	stactor, soil head space r vi chloride.	eading in peris permillion. 3. GW=groundwetersample	dashed graphic indicates approximate IAN 23 201
Approximate v  ✓ prior to well de	vater level observe evelopment,	ed			WATER RESOURCES

			1	Project N 8128.0	Well Number WS-11	Sheet 4 of 11		
Se De	61		Sample		77.06	T	Soil Description	4 07 11
(feet,	Interval Percent	Recovery Coffection Method	Number	Name (Type)	Blows/6"	Lithalogic Calumn		
26				PID = 0.0				
57								
	10	0% CB		PID = 0.0		TF:571	67.0 to 67.5 feet: NO RECOVERY; sluff. 67.5 to 72.0 feet: SAND (SP); dark gray; 5%	fines, non plastic: 95% sand
89				PID = 0.0			fine; micaceous; organic debris, roots; m	olst to wet.
70		GW		WS11-W-72.	)		@ 70.0 feet: 0.2-foot layer of slit with organic	c debris.
71	шнанинанани			PID = 0.0				
2	80	0% СВ		PID = 0.0			72.0 to 75.0 feet. NO RECOVERY; stuff.	
3								
74								
75							75.0 to 78.0 feet: SILTY SAND (SM) dark gr sand, fine to medium, micaceous, wet	ay; 20% fines, non plastic; 8
66 57 88 89 70 71 72 73 74	10 International 80							
8				PID = 0.0			78.0 to 82.0 feet   SAND (SP); dark gray, 5%	fines, non plastic; 95% sand
9							fine, micaceous; wet	
30				PID = 0.0				
30 31 32 33 34 35 36				PID = 0.0			82.0 to 83.0 Teet "SILT (ML); dark gray; 95%	fines, non plastic; 5% sand,
33							fine, sand in pockets; micaceous; organic 83.0 to 84.0 feet: SAND (SP); dark gray; 5% fine; micaceous; organic debris; wet.	
4							84.0 to 85.5 feet SILTY SAND (SM); dark g sand, line to medium; micaceous, wet.	ray; 20% lines, non plastic; 8
5		GW	,	W\$11-W-87.0 PID = 0.0	)			
6	10 10 10 10 10 10 10 10 10 10 10 10 10 1			F10 = 0.0			85.5 to 86.0 feet: SILT (ML), dark gray; 85% fine, send in pockets: microscus; moist, 86.0 to 87.0 feet: SAND (SP); dark gray 5%	fines, non plastic, 90% sand
37	10	0% CB		PID = 0.0			fine; 5% organic debris, woody debris, m 87.0 to 87.5 feet: SAND (SP); dark gray; 5%	
	= 4x6-inch core barrel s ad intervel. 4, bgs = b						reading in parts per milion. 3. GW = groundweter sample, o	deshed graphic indicates approximate  JAN 23 201

Mau	II Fo	oster & A	Nor	ngi, i	nc.		Project N 8128.0		r	Well Number WS-11	Sheet 5 of 11
S)		Wel			_ S	ample		01.00		Soil Description	
Depth (feet, BGS)		Details	Interval	Percent Recovery	Coffection Method	Number .	Name (Type)	Blows/6"	Lithologic Column		
88 89							PID = 0.0			fine; micaceous; wet.  87.5 to 88.0 feet: SILT with SAND (ML);  37% sand, fine to medium; micaceous 88.0 to 92 5 feet: SAND (SP); dark gray; fine, micaceous; wet.	dark gray; 70% fines, non plastic; ss. organic datais; moist to wet. 5% fines, non plastic; 95% sand,
90				9			PID = 0.0				
91											
92									mmm	92.5 to 94.5 feet: SILT (ML); dark gray,	00% finas martium plasticity 10%
93										sand fine to medium, sand in pocket	ts; micaceous; organic debris; wet
95										94.5 to 98.0 feet SAND (SP); dark gray; fine, micaceous; wet.	5% fines, non plastic; 95% sand,
96							PID = 1.5			m re, i resembleshing reve	
97							PID = 1.5				
98										98.0 to 102.0 feet: SAND with SILT (SP- plastic, 85% sand, fine to medium; m nodules, up to 0.5-inches in diameter	nicaceous, wet. Fines occur in
100										TOURCS, Up to U.O's Ki las si lastinated	*
101			Ter to see to so so so to see on ten id		GW	ν	VS11-W-102. PID = 4.5	0			
02			Brussel	100%	CB		PID = 13.6			102 0 to 107.0 feet: SANID (SP); dark grifting fine to medium, red and green lithics;	ay, 5% fines, non plastic; 95% sar
100	60 60 60 60 60 60 60 60	8 8 9 8 9 8 9 8 9 8 9 8 9 8 9 8 9 8 9 8	The Paris				PID = 0.0			THE RESTORMENT FOR DEAL PROPERTY.	removeded from
104	00	00									
06							PID = 0.0		ການກຸກາງ ກັນການກຸກ	@ 105.0 feet 0.2-foot layer of SILT (ML, fine, sand in pockets; wet. @ 105.5 feet 0.2-foot layer of SILT (ML, fine, pend in pockets; unit	
107				90%	СВ		PID = 0.0			fine, sand in pockets; wet.  107 0 to 108.0 feet. NO RECOVERY.	
08				2 0000			PID = 3.0			108.0 to 112.0 feet: SILT (ML); dark gra to medium plasticity; micaceous; org	
09										to meaturn plasticity, micalceous; org Visible sheen on water in soil core bag.	
10			-		L				ШШШ		RECEIVE
VOTE							Photo ionizacion de 5. PVC = poly vinj			reading in parts per million. 3. GW = groundwater san	npte, dashed graphic indicates approximate JAN 23 21

Soft Description   Soft Descri	Ma	ul Foster & /	nc.		Project N 8128.0	lumbe	r	Borehole Log/Well Construction  Wel Number Shee WS-11 6 of 1	ā		
### 1100% CB PID = 0.0  ### 1100% CB PID = 3.1  ### 1100% CB PID = 0.0  ### 11	(55		T	_	<sub>s</sub> S	ample i					
112 0 to 116 0 finet. SAND (SP), dark gray, 5% finas, non plastic, 95% sat fine to medium, red and green Brics; micrococcus; wet.  113	Depth (feet, BC	Details	Interval	Percent Recovery	Collectio	Number	Name (Typs)	Blows/8	Lithologi Column		
112 D to 118.0 Neet: SAND (SP), dark gray; 5% finas, non plastic, 95% sa fine to medium, and and green thics; micrococus; well  115		왕들의 왕					PID = 3.1	-			
113   112   116 0 feet   SAND (SP); dark gray, 75% finas, non plastic, 95% sat fine to medium, red and green librics, microcouse, well   116   WS11+W-IDUP   PID = 3.1   117   PID = 6.2   118.0 feet   0.1-local layer of SILT (ML). 118   PID = 6.2   118.0 feet   0.1-local layer of SILT (ML). 119   PID = 6.2   118.0 feet   0.1-local layer of SILT (ML). 119   PID = 6.2   118.0 feet   0.1-local layer of SILT (ML). 119   PID = 1.1   PID = 6.2   118.0 feet   0.1-local layer of SILT (ML). 119   PID = 1.1   PID = 6.2   118.0 feet   0.1-local layer of SILT (ML). 119   PID = 1.1   PID = 6.2   118.0 feet   0.1-local layer of SILT (ML). 119   PID = 1.1   PID = 1.1   PID = 1.2   PID = 1.1   PID = 1.2   PID	111										
113    110   PID = 0.0   PID = 3.1     118   De 1180 feet SAND (SP), dark gray, 75% fress, non pleasis, 95% said free to medium, red and green librics, microcous, well wish 114     116   WS11-W-DUP PID = 3.1     118   De 1180 feet SLT Y SAND (SM), dark gray, 20% fress, non pleasis, 95% said, free to medium well with 115     118   De 1180 feet SLT (ML), dark gray, 20% fress, non pleasis, 95% said, free to medium well with 115     118   De 1180 feet SLT (ML), dark gray, 95% fress, tow to medium pleasisty, 95% said, free to medium medium gloss free, 100% continued to medium pleasisty, 95% said, free to medium, red and green librics, microcous, well     120   De 120 feet SLT (ML), dark gray, 95% fress, tow to medium pleasisty, 95% said, free to medium, red and green librics, microcous, well     120   De 120 feet SLT (ML), dark gray, 95% fress, tow to medium pleasisty, 95% said, free to medium, red and green librics, microcous, well     121   De 120 feet SLT (ML), dark gray, 75% fires, non pleasis; 95% said free to medium, red and green librics, microcous, well     122   De 1320 feet SLT (ML), dark gray, 75% fires, non pleasis; 95% said free to medium, red and green librics, microcous, well     123   De 1320 feet SAND (SP), dark gray, 75% fires, non pleasis; 95% said free to medium, red and green librics, microcous, well     124   De 1320 feet SAND (SP), dark gray, 75% fires, non pleasis; 95% said free to medium, red and green librics, microcous, well     125   De 1320 feet SAND (SP), dark gray, 75% fires, non pleasis; 95% said free to medium, red and green librics, microcous, well     126   De 1320 feet SAND (SP), dark gray, 75% fires, non pleasis; 95% said free to medium, red and green librics, microcous, well     127   De 1320 feet SAND (SP), dark gray, 75% fires, non pleasis; 95% said free to medium, red and green librics, microcous, well     127   De 1320 feet SAND (SP), dark gray, 75% fires, non pleasis; 95% said free to medium, red and green librics, microcous, well     127   De 1320 feet SAND (SP), dark gray	112										
PID = 0.0   PID = 3.1	172								11111	112.0 to 118.0 feet: SAND (SP); dark gray; 5% fines, non ples	tic; 95% san
115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115   115	113						BID = 0.0			in to 10 finada ii, fou and gradit minas, finadadus, wat.	
1150   1160 feet 0.1-bot layer of SiLT (ML).	111						PID = 0.0				
1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160   1160	117										
### 1100% CB PID = 3.1    PID = 3.1   PID = 3.1   PID = 3.1   PID = 3.1   PID = 3.1   PID = 6.2   PID = 3.1   PID = 6.2   PID = 3.1   PID = 6.2   PID	115				CIA		1044 14/447				
118   118.0 to 118.5 feet SLTY SAND (SM), dark gray, 20% fines, non plastic; 30% sand, fire to madium, wet. Sprag coder, velocity streen on spiles streen on spiles streen on spiles streen on spiles. Spiles gray on spiles streen on spiles streen on spiles. The SAND (SP) dark gray, 95% fines, tow to madium of plastic; 10% spiles streen on spiles. The SAND (SP) dark gray, 95% fines, tow to madium of plastic; 10% spiles and property of the spiles of the spiles of the spiles of the spiles. The spiles are spiles. The spiles are spiles are spiles are spiles are spiles are spiles. The spiles are spiles are spiles are spiles are spiles. The spiles are spiles are spiles are spiles are spiles are spiles. The spiles are spiles are spiles are spiles are spiles are spiles. The spiles are spiles are spiles are spiles are spiles are spiles. The spiles are spiles are spiles are spiles are spiles are spiles. The spiles are spiles are spiles are spiles are spiles are spiles. The spiles are spiles are spiles are spiles are spiles are spiles. The spiles are spiles are spiles are spiles are spiles are spiles. The spiles are spiles are spiles are spiles are spiles are spiles. The spiles are spiles are spiles are spiles are spiles are spiles. The spiles are spiles are spiles are spiles are spiles are spiles. The spiles are spiles are spiles are spiles are spiles are spiles. The spiles are spiles are spiles are spiles are spiles are spiles. The spiles are spiles are spiles are spiles are spiles are spiles. The spiles are spiles are spiles are spiles are spiles are spiles. The spiles are spiles are spiles are spiles are spiles are spiles. The spiles are spiles are spiles are spiles are spiles are spiles are spiles. The spiles are spiles. The spiles are spiles. The spiles are spiles are spiles are spiles are spiles are sp	116		*		GVV		WS11-W-DUR	,			
118 b to 118.5 feet: SLTY SAND (SM); dark gray; 20% fines, non plastic; 30% sand, fine to medium, wet.  119 strong coder velocity streng on spiles the propriet.  120 ptD = 0.0  121 ptD = 0.0  122 b to 1230 feet: SLTY SAND (SM); dark gray; 20% fines, non plastic; 30% sand, fine to medium. Wet. Fait todar.  121 ptD = 0.0  122 b to 1230 feet: SAND (SP); dark gray; 50% fines, ton to medium. Plastic todar.  123 b to 1270 feet: SAND (SP); dark gray; 50% fines, non plastic; 95% sand fine to medium, microscous; wet.  124 ptD = 0.0  125 b to 1250 feet: SAND (SP); dark gray; 75% fines, non plastic; 95% sand fine to medium, microscous; wet.  126 b to 1270 feet: SAND (SP); dark gray; 75% fines, non plastic; 95% sand fine to medium, red and green finitis; microscous; wet.  127 b to 1280 feet: SAND (SP); dark gray; 75% fines, non plastic; 95% sand fine to medium, red and green finitis; microscous; wet.  128 b to 1320 feet: SAND (SP); dark gray; 75% fines, non plastic; 95% sand fine to medium, red and green finitis; microscous; wet.  128 b to 1320 feet: SAND (SP); dark gray; 75% fines, non plastic; 95% sand fine to medium, red and green finitis; microscous; wet.  129 b to 1370 feet: SAND (SP); dark gray; 75% fines, non plastic; 95% sand fine to medium, red and green finitis; microscous; wet.  129 b to 1370 feet: SAND (SP); dark gray; with white specides, said and to medium, red and green finitis; microscous; wet.  120 b to 1370 feet: SAND (SP); dark gray; with white specides, said and to medium, red and green finitis; with the specides, said and to medium, red and green finitis; with the specides, said and to medium, red and green finitis; with the specides, said and to medium, red and green finitis; with the specides, said and the specides of the said speci	. 110						PID = 3.1		itin ati	@ 116.0 feet: 0.1-foot layer of SILT (ML).	
PID = 6.2  118.0 to 118.5 feet. SILTY SAND (SM), dark gray, 20% fines, non plastic, 80% sand, fine to medium, wet.  Strong oder, visible sheen on soil.  118.5 to 118.5 feet. SAND (SM), dark gray, 20% fines, non plastic, 118.5 to 118.5 feet. SAND (SM), dark gray, 50% fines, non plastic, 118.5 to 118.5 feet. SAND (SM), dark gray, 50% fines, non plastic, 118.5 to 118.5 feet. SAND (SM), dark gray, 50% fines, non plastic, 119.5 to 118.5 feet. SAND (SM), dark gray, 50% fines, non plastic, 119.5 to 118.5 feet. SAND (SM), dark gray, 50% fines, non plastic, 119.5 to 118.5 feet. SAND (SM), dark gray, 50% fines, non plastic, 119.5 to 118.5 feet. SAND (SM), dark gray, 50% fines, non plastic, 119.5 to 118.5 feet. SAND (SM), dark gray, 50% fines, non plastic, 119.5 to 118.5 feet. SAND (SM), dark gray, 50% fines, non plastic, 119.5 to 118.5 feet. SAND (SM), dark gray, 50% fines, non plastic, 119.5 to 118.5 feet. SAND (SM), dark gray, 50% fines, non plastic, 119.5 to 118.5 feet. SAND (SM), dark gray, 50% fines, non plastic, 119.5 to 118.5 feet. SAND (SM), dark gray, 20% fines, non plastic, 119.5 feet. 119.5 to 118.5 feet. 119.5 feet	117			000/	00						
PID = 6.2    TIBD & TIBS & Set SILTY SAND (SM), dark gray, 20% fires, non plastic, 95% set Silty of the state of the threatment of the state of the	110		1	00%	LB		PID = 3.1				
190	. 110						PID = 6.2		TIT		non plastic;
plaston. 25 send fine to medium. red and green lithics, microcous; wet.    PID = 0.0   PID	119									Strong odor, visible sheen on soil.	
PID = 0.0    Top in the part of the part o	120								ffiliti'	plesting. 5% and fine to medium; wet. Faint odor.	SOLUTI
Dissilory, 5% sand, fire to medium, rick gray, 95% fires, non plastic; 95% sand fire to medium, rick and green lithics, micaceous; wet.  122	120						PID = 0.0			fine to medium, red and green lithics; micaceous; wet.	
fine to medium, red and green lithics, micaceous; wet.  123   124   1220 to 1230 feet. SILT (ML); dark gray, 95% lines, low to medium plasticity. 5% sand, fine to medium, micaceous; wet.  124   125   126   1270 feet. SAND (SP); dark gray, 75% fines, non plastic; 95% satisfine to medium, red and green lithics; micaceous; wet.  126   1270 to 1280 feet. SiLTY SAND (SM); dark gray, 70% fines, non plastic; 95% satisfine to medium, red and green lithics; micaceous; wet.  127   1280 feet. SiLTY SAND (SM); dark gray, 70% fines, non plastic; 95% satisfine to medium, red and green lithics; micaceous; wet.  128   129   120 to 1320 feet. SAND (SP); dark gray; 75% fines, non plastic; 95% satisfine to medium, red and green lithics; micaceous; wet.  129   130 feet. 0.3-foot layer of SILT (ML); dark gray, organic debrits.  130   131   132   1320 feet. SAND (SP); dark gray with white speckles, salt and 1320 to 1370 feet. SAND (SP); dark gray with white speckles, salt and 1320 to 1370 feet. SAND (SP); dark gray with white speckles, salt and 1320 to 1370 feet. SAND (SP); dark gray with white speckles, salt and 1320 to 1370 feet. SAND (SP); dark gray with white speckles, salt and 1320 to 1370 feet. SAND (SP); dark gray with white speckles, salt and 1320 to 1370 feet. SAND (SP); dark gray with white speckles, salt and 1320 to 1370 feet. SAND (SP); dark gray with white speckles, salt and 1320 to 1370 feet. SAND (SP); dark gray with white speckles, salt and 1320 to 1370 feet. SAND (SP); dark gray with white speckles, salt and 1320 to 1370 feet. SAND (SP); dark gray with white speckles, salt and 1320 to 1370 feet. SAND (SP); dark gray with white speckles, salt and 1320 to 1370 feet. SAND (SP); dark gray with white speckles, salt and 1320 to 1370 feet. SAND (SP); dark gray with white speckles, salt and 1320 to 1370 feet. SAND (SP); dark gray with white speckles, salt and 1320 to 1370 feet. SAND (SP); dark gray with white speckles, salt and 1320 to 1370 feet. SAND (SP); dark gray with white speckles, salt and 1320 to 1370 feet. SAND (SP	121		No.							plasticity: 5% sand, fine to medium; micaceous; wet.	
123   PID = 0.0   122.0 to 123.0 feet: SiLT (ML); dark gray, 95% fines, low to medium plasticity, 9% sand, fine to medium, micaceous, wet.   123   125   127.0 feet: SANID (SP); dark gray, 55% fines, non plastic; 95% sand, fine to medium, red and green lithics, micaceous, wet.   126   127   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128   128	400									fine to medium, red and green lithics; micaceous; wet.	UC, 9076 SELL
PID = 0.0  123.0 to 127.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sai fine to medium, red and green lithics, micaceous; wet.  125  127  128  129  120  127.0 to 128.0 feet: SILTY SAND (SM); dark gray; 20% fines, non plastic; 95% sai fine to medium, red and green lithics; wet.  128  129  130  131  132  134  135  136  137.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sai fine to medium, red and green lithics; micaceous; wet.  130  131  132  133  134  135  136  137.0 feet: SAND (SP); dark gray; with white speckles, sait and said specific indication deador, soil hard space reading in pats per mica. 3 GW= groundwater sample, deated graphs in the sample of sector, soil hard space reading in pats per mica. 3 GW= groundwater sample, deated graphs in the sample plant parts per mica. 3 GW= groundwater sample, deated graphs in the sample plant in the sample plant in the sample plant in the sample graphs in the sample plant in the sample plant in the sample graphs in the	122									122.0 to 123.0 feet. SILT (ML); dark gray, 95% lines, low to mi	edium
fine to medium, red and green lithics; micaceous; wet.  PID = 0.0	123						D/D = 0.0				E 050/
PID = 0.0	404						PID = 0.0			fine to medium, red and green lithics; micaceous; wet.	IIC; 90% SBN
PID = 0.0	124										
NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, deshed graphic indicates appropriate a	125	news n ne					200 00				
NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, deshed graphic indicates appropriate a	400	00000 00 00000 00					PID = 0.0				
NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, deshed graphic indicates appropriate indicates a processing in parts per million.	120	######################################									
NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, deshed graphic indicates appropriate a	127			000/	-				- T- T- T-		
NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, deshed graphic indicates appropriate a	120		1	00%	CB		PID = 0.0			80% sand, fine to medium, red and green lithics; wet.	non plasac;
NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, deshed graphic indicates appropriate a	120								4		tic; 95% san
NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, deshed graphic indicates appropriate a	129									ите во птеснить, red вта green илися; micaceous; Wet	
NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, deshed graphic indicates appropriate a	120										
NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, deshed graphic indicates appropriate indicates a processing in parts per million.	- 100		Hams		GW	V		0	Milling	@ 130.0 feet: 0.3-foot layer of SILT (ML); dark gray, organic of	lebris.
NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, deshed graphic indicates appropriate indicates a processing in parts per million.	131		311111111111111111111111111111111111111				FID = 0.0				
NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, deshed graphic indicates appropriate a	130		THE REP							D	CEN
NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, deshed graphic indigetal producings screened intervel. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.	132			00%	СВ		PID = 0.0		44. 4.4	132.0 to 137.0 feet: SANID (SP); dark gray with white specide	s, salt and
2 × 20 × 20 × 20 × 20 × 20 × 20 × 20 ×	NOTE	ES: 1. CB = 4x6-inch o	core barre 4. bgs=	soi sa below	mpler. 2 ground s	PID=F	Photo ionization de 5. PVC = poly viny	tector, a	oil head space i	eading in parts per micon. 3. GW = groundwater sample, deshed graphic indicates	Napping.
Approximate water level observed WATER RESOUR			_				F-7 V			WATER	RESOUR

								: Borehole Log/Well Con	
Mai	ul Foster & /	Alongi	, Inc.		Project i 8128.			Well Number WS-11	Sheet 7 of 11
(S	Well		_	Sample		01.00	1	Soil Description	
Depth (feet, BGS)	Details	Interval	Collection	Number	Name (Type)	Błows/6"	Lithologic Column		
133					PID = 0.0			pepper look; 5% fines, non plas wet.	tic; 95% sand, medium; micacecus;
135	(1202) (P2 01010) [II 01010] [II 00010] [II 00010] [II	Sancte			PID = 0.0				-
137		70	% CI	3	PID = 0.0			137.0 to 140. <b>0 feet. NO RECOVERY</b> .	
139	######################################								٨
141	TATO D TA				PID = 0.0			140.0 to 146.5 feet SAND (SP); dark g pepper look; 5% fines, non plastic; 9 red lithics; micaceous; wet	ray with white specides, salt and 5% sand, medium, dark green and
143					PID = 0.0				-
145		n m m m d	GI	v i	VS11-W-147 PID = 0.0	.0			
147		100	% CI	3	PID = 0.0			146,5 to 147,0 feet: SILT (ML); derk gra- plasticity: 5% sand, fine to modium, 147.0 to 150.0 feet: SAND (SP); dark g	sand in pockets: micageous: wet
148					PID = 0.0			medium, dark green and red lithics;	micaceous; wet
150					PID = 0.0			150.0 to 152.0 feet: SILT with SAND (fi medium plasticity, 30% sand, fine to organic debris; wet.	VIL); clark gray, 70% fines, low to medium, sand in pockets; micaceous;
152								152.0 to 153.0 feet: SAND (SP); dark g medium, dark green and red lithics;	
154					PID = 0.0			organic debris; wet	medium, sand in pockets; micaceous;
NOTE	screened interval.	4. bgs=ba	low groun	d surface.				reading in parts per milion, 3, GW = groundwaterss	mple, destred graphic indicates approximate  JAN 23 2015
V	Approximate was prior to well dev	eter level relopmen	o <b>bser</b> t.	ved					WATER RESOURCES DEPT

	d Footon 9 d	Manat I						Borehole Log/Well Con	
IVIA	ul Foster & A	Alongi, II	IC.		Project N 8128.0			Well Number WS-11	Sheet 8 of 11
BGSJ	Weil Details	± ±	S	ample L	Date	* * * * * * * * * * * * * * * * * * *	gic	Soil Description	on
Depth (feet, E		Interval Percent Recovery	Collection	Number	Name (Type)	Blows/6	Lithologic Column		
455					PID = 0.0				
156		100%	CB		PID = 0.0			<u>(@. 157.0 feet   0.2-foot layer of SILT (Mt</u> 157.2 to 160.0 feet   SAND (SP); dark g	9
158								157.2 to 160.0 feet: SAND (SP); dark g pepper look; 5% fines, non plastic; 9 lithics; wet.	ray with white speckles, salt and 5% sand, medium, green and red
160					PID = 0.0			160.0 to 161.0 feet SILT with SAND (N	AL); dark gray, 70% fines, low to
161								medium plasticity; 30% sand, fine to 161.0 to 164.0 feet SAND (SP); dark g pepper look; 5% fines, non plastic; 9 lithics; wet	medium; wet ray with white speckles, saft and
_ 162 163					PID = 0.0			@162.0 feet: 0.3-foot layer of SiLT (ML) @162.8 feet: 0.3-foot layer of SiLT (ML)	
164					7 12 - 0.0			164.0 to 165.0 feet SILT (ML); clark gra medium plasticity; 10% sand, fine, s	ay to greenish-gray; 90% fines, low to send in pockets, organic debris; wet.
_ 165 _ 166	1010101010 1010101010 1010101010 1010101010 1010101010 1010101010	нивини пини	GW	и	/S11-W-167. PID = 0.0	0		165.0 to 165.5 feet SANDY SILT (ML); fines. non plestic: 40% sand, fine: 1 165.5 to 167.0 feet: SAND (SP); dark g pepper look; 5% fines, non plestic; 9 lithics; wet	wet aray with white speckles, salt and
167 168	10000000 100000000 100000000 100000000	80%	CB		PID = 0.0			167.0 to 169.0 feet. NO RECOVERY.	
169 170	6,60,00,00,00,00,00,00,00,00,00,00,00,00				PID = 0.0			wet	95% sand, fine, green and red lithics;
_171 _172							111	170.5 to 171 feet: SILTY SAND (SM); on 80% sand, fine; wet. 171.0 to 174.0 feet: SAND (SP); dark gifting to medium, dark green and red	ray, 5% fines, non plastic; 95% sand,
173 174					PID = 0.0				
_175 _176	TOTOTOTO TOTOTOTO TOTOTOTO TOTOTOTO TOTOTOTO TOTOTOTO TOTOTOTO TOTOTOTO TOTOTOTO TOTOTOTO TOTOTOTO TOTOTOTO TOTOTOTO TOTOTOTO TOTOTOTO TOTOTO TOTOTO TOTOTO TOTO TOTOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOTO TOT				PID = 0.0			174.0 to 174.5 feet: SILT (IML); dark gro medium plasticity: 10% sand fire, ; 174.5 to 179.0 feet: SAND (SP); dark g pepper look; 5% fines, non plastic; 9 red lithics; wet	sand in pockets: wet
173 174 175 176 177 NOTE	0,00,00,00 0,000,00 0,000,00 0,000,00	100%			PID = 0.0				
NOTE	ES: 1, CB = 4x6-inch o screened interval.	core barrel soil sa 4. bgs = below	mpier. 2 ground s	. PID = F urface. 5	Photo ionization da i. PVC = poly ving	elector, s A chloric	soil head space de.	reeding in perts per million, 3. GW = groundwittells:	Company of the pass approximate
$\nabla$	Approximate wa	ter level ob			- 04054			JAI	N 23 2015

Ma	ul Foster & A	Mor	nai k	nc	<u> </u>	Project I			Borehole Log/Well Cons	Sheet
IVIC	ui rosiei ot i	AIQI	ıyı, ı	IIG.		8128.			WS-11	9 of 11
BGS)	Well			<sub>5</sub> S	ample	Data		ي	Soil Description	
# B	Details	Interval	Percent Recovery	Collection	Number	Name (Type)	Blows/6	Lithologic Column		
(feet,		Inte	2 6	3₹	New	710.0(1)	BR	38		
178	00000000							51755517		
	00000000000000000000000000000000000000					PID = 0.0				
179	000000000									
									179.0 to 182.0 feet: SAND (SP); dark gra pepper look; 100% send, medium, gre	y with white speckles, salt and en and red lithics: wet.
180		-		GW		VS11-W-182	0		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
404	00000000	=======================================		G		PID = 0.0				
181	000000000 000000000									
182	00000000	Hisawamman								
		F	100%	CB		PID = 0.0		77.77	182.0 to 187.0 feet: SAND (SP); dark gray fine, red lithics; wet.	v, 5% fines, non plastic; 95% sand
183	00000000000000000000000000000000000000								III IC, TOU RUICS, WOL	
	00000000					PID = 0.0				
184										
40E		100								
185						PID = 0.0				
186										
	0000000000 000000000 00000000									
187	000000000									
			90%	CB		PID = 0.0			187.0 to 188.0 feet. NO RECOVERY.	
188	000000000							1377.TE	188.0 to 195.0 feet: SAND (SP); dark gra	v: 5% fines, non plastic: 95% sand
189	00000000								fine, red lithics; wet.	,, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
100	00000000000000000000000000000000000000									
190										
	000000000	8				PID ≈ 0.0				
191										
400	00000000000000000000000000000000000000									
192	000000000									
193		8								
	00000000					PID = 0.0		1111		
194	00000000000000000000000000000000000000									
	000000000									
195				GW		 WS11-W-197	0	THIT	195.0 to 195.5 feet. SILT (MIL); dark gray	to greenish-grav, 95% fines. Inw
196	000000000	III II III III III III III III III III		"	ľ	PID = 0.0		HHH	plasticity; 5% sand, fine, sand in poor	kets; organic debris, roots, leaves,
190	000000000 000000000	HHHH				1			wet. 195.5 to 201.0 feet SAND (SP); dark gra	y, 5% fines, non plastic; 95% sand
197		# H							fine to medium, red lithics; wet.	
		T	40%	CB		PID = 0.0		11 11		
198										
	00000000									
199	00000000000000000000000000000000000000	-						13/1/2		
200										RECEIVED
NOT	ES: 1. CB = 4:6 inch	core ba	mel soil se	empler: 2	2 PIO=	Photo ionization di	elector, s	soil head space	reading in parts per million. 3. GW = groundwater sam	de, dashed graphic indicates approximate
						a rvo=poly wn	yr u llulli,			JAN 23 ZUIS
Ā	Approximate was prior to well dev			bserve	d					WATER RESOURCES D

WATER RESOURCES D SALEM, OREGON

					Geologi	ic Borehole Log/Weli Con	struction
Mau	ul Foster & A	Alongi,	lnc.	Project / 8128.		Well Number WS-11	Sheet 10 of 11
BGS)	Nei		5 8	Sample Data		Soil Description	n
Depth (feet, BC	Details	Interval Percent Recovery	Collection	Name (Type)	Blows/6" Lithologic Column	ı	
201				PID = 0.0			
				PID = 0.0	0000	85% gravel, fine to coarse, subroun	iM); dark gray; 15% fines, non plastic; ded to rounded; wet.
204	jiajiajiajia pogajajiajia pogajajiajia pogajajiajia pogajajiajia pogajajiajia pogajajiajia		GW	WS11-206.0			
_200	00000000 0000000 0000000 0000000 000000	# 00 150 N W6 23 NH 51 113 HI III I				204.5 to 207.0 feet: BASALT; light gray (Columbia River Besalt Group) Signarciness.	to dark gray, moist to wet, bedrock vilicant increase in resistance, drilling
_206							
207	000000000					1	

#### WS11 Completion Details

Oregon Water Resources Department Well Start Card Number: W147655 Oregon Water Resources Department Well Identification Number: L67076

#### Boring:

- 0.0 to 58.0 feet bgs: 9-inch temporary, threaded steel, isolation casing. 0.0 to 137.0 feet bgs: 8-inch temporary, threaded steel, isolation casing.
- 0.0 to 58.0 feet bgs: 7-inch temporary, threaded steel, isolation casing. 0.0 to 207.0 feet bgs: 6-inch temporary, threaded steel, isolation casing.
- 0.0 to 207.0 feet bgs: 4x6-inch core barrel sampler.
- 0.0 to 1.5 feet bgs: flush mount vault and cement seal.
- 1.5 to 5.0 feet bgs: 3/8-inch Baroid bentonite chips hydrated with potable water.
- 5.0 to 102.0 feet bgs: bentonite grout surry, 10.0 pounds per gallon.
  102.0 to 104.0 feet bgs: non-ecetone coated, 3/8-inch bentonite chips hydrated with potable water.
- 104.0 to 106.0 feet bgs: 20x40 washed Colorado silica sand, secondary filter pack
- 106.0 to 124.0 feet bgs: 10x20 washed Colorado silica sand, primary filter
- pack.
  124.0 to 126.0 feet bgs: non-acetone coated, 3/8-inch bentonite chips hydrated with potable water.
- 126.0 to 139.0 feet bgs: benionite grout slurry, 10.3 pounds per gallon. 139.0 to 140.0 feet bgs: non-acetone coated, 3/8-inch bentonite chips hydrated with potable water.
- 140.0 to 142.0 feet bgs: 20x40 washed Colorado silica sand, secondary filter pack.
- 142.0 to 161.0 feet bgs: 10x20 washed Colorado silica sand, primary filter
- 161.0 to 207.0 feet bgs: non-acetone coated, 3/8-inch bentonite chips hydrated with potable water.

Well WS11-125: 0.0 to 109.0 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe. 109.0 to 124.0 feet bgs: 2-inch diameter, stainless steel wire wrapped screen, 0.010-slot.

124.0 to 125.0 feet bgs: 2-inch diameter, stabless steel sump.

NOTES: 1. C8 = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed grephic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. JAN 23 2015

Approximate water level observed prior to well development.

WATER RESQUECES DEPT

WYGINTYGINTWPROJECTS/8128-01/WS10-13.GPJ

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700 000					Geologic	Borehole Log/Well Con	struction
Mau	Foster &	Alongi, Inc.		Project Num 8128.01.0		Well Number WS-11	Sheet 11 of 11
Depth (feet, BGS)	Well Details	Interval Percent Recovery Collection	Sample	Data   Name (Type)   8	Lithologic	Soll Descriptio	n

Well WS11-161:
0.0 to 145.0 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe.
145.0 to 160.0 feet bgs: 2-inch diameter, stainless steel wire wrapped screen, 0.010-slot.
160.0 to 161.0 feet bgs: 2-inch diameter, stainless steel sump.

RECEIVED

NOTES: 1. CB = 4x6-inch core benef soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundweter sample, deshed graphic indicates approximate screened interval. 4. bgs = below ground surface. 6. PVC = poly vinyl chloride.

JAN 2.3 2015

Approximate water level observed prior to well development.

WATER RESOURCES DEPT SALEM, CREGON

Project Comportation Project C	Mau	ıl Foster &	Alongi	, Inc.		ct Numb 28.01.08		Well Number WS-14	Sheet 1 of 11
Details    Page   Details   Page   Details   Page   Details   Page   Details   Page   Details   Page   Details   Page   Details   Page   Details   Page   Details   Page   Details   Page   Details   Page   Details   Page   Details   Page   Details   Page   Details   Page   Details   Page   Details   Detail	Proje Stan Drille Geo	lect Location t/End Date ler/Equipment blogist/Engineer	7200 NW 6/22/2004 Boart Lot ABC/EB	Front Av to 7/9/2 ngyear/R	ion venue Portlend, 0 004 lotosonic			TOC Elevation (feet) Surface Elevation (feet) Northing Easting Hole Depth	
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	(\$8)		T	S S			ړ	Soil Description	
non plastic, 30% gravels, fine, subangular, trace organic debris; dr. pp. pp. pp. pp. pp. pp. pp. pp. pp. p	Depth (feet, BG	Details	Interval	Collectic	Name (Typ	Blows/6	Litholog		
PID = Oppm.  PID = Oppm.  14.0 to 16.0 feet. SAND (SP); light grayish-brown; 100% send, fine; trace fines, trace organic debris, no noticeable odor, damp.  15. 16.0 to 18.5 feet. GRAVELLY SAND (SP); light grayish-brown; 70% sar fine; 30% gravels, fine to medium, subangular, trace fines; damp.  18.5 to 22.0 feet. SAND (SP); dark yellowish-brown; 100% sand, fine; trace fines, non plastic; damp.  PID = Oppm.  18.5 to 22.0 feet. SAND (SP); dark yellowish-brown; 100% sand, fine; trace fines, non plastic; damp.  PID = Oppm.			100	CB				0.0 to 1.3 feet: GRAVELLY SILT (ML); dark ye non plastic; 30% gravels, fine, subangula	allowish-brown; 70% fines, ir, trace organic debris; dry.
PID = Oppm.  PID = Oppm.  14.0 to 16.0 feet. SAND (SP); light grayish-brown; 100% send, fine; trace fines, trace organic debris, no noticeable odor, damp.  15. 16.0 to 18.5 feet. GRAVELLY SAND (SP); light grayish-brown; 70% sar fine; 30% gravels, fine to medium, subangular, trace fines; damp.  18.5 to 22.0 feet. SAND (SP); dark yellowish-brown; 100% sand, fine; trace fines, non plastic; damp.  PID = Oppm.  18.5 to 22.0 feet. SAND (SP); dark yellowish-brown; 100% sand, fine; trace fines, non plastic; damp.  PID = Oppm.	2				PID = 0pp	m.	O P TO	1.3 to 10.0 feet: SILTY SAND (SM); dark gray 50-60% sand, fine; damp.	; 40-50% fines, low plasticity
PID = Oppm.  PID = Oppm.  14.0 to 16.0 feet. SAND (SP); light grayish-brown; 100% send, fine; trace fines, trace organic debris, no noticeable odor, damp.  PID = Oppm.  16.0 to 18.5 feet. GRAVELLY SAND (SP); light grayish-brown; 70% sar fine; 30% gravels, fine to medium, subangular, trace fines; damp.  PID = Oppm.  18.5 to 22.0 feet. SAND (SP); dark yellowish-brown; 100% sand, fine; trace fines, non plastic; damp.  PID = Oppm.	<i>4 5</i>		809	6 СВ					
PID = Oppm.  PID = Oppm.  14.0 to 16.0 feet. SAND (SP); light grayish-brown; 100% send, fine; trace fines, trace organic debris, no noticeable odor, damp.  PID = Oppm.  16.0 to 18.5 feet. GRAVELLY SAND (SP); light grayish-brown; 70% sar fine; 30% gravels, fine to medium, subangular, trace fines; damp.  PID = Oppm.  18.5 to 22.0 feet. SAND (SP); dark yellowish-brown; 100% sand, fine; trace fines, non plastic; damp.  PID = Oppm.	6				<i>PlD</i> = 0ρρ	m.		@ 5.0-feet Increased fines to 50%.	
PID = Oppm.  PID = Oppm.  14.0 to 16.0 feet. SAND (SP); light grayish-brown; 100% send, fine; trace fines, trace organic debris, no noticeable odor, damp.  15. 16.0 to 18.5 feet. GRAVELLY SAND (SP); light grayish-brown; 70% sar fine; 30% gravels, fine to medium, subangular, trace fines; damp.  18.5 to 22.0 feet. SAND (SP); dark yellowish-brown; 100% sand, fine; trace fines, non plastic; damp.  PID = Oppm.  18.5 to 22.0 feet. SAND (SP); dark yellowish-brown; 100% sand, fine; trace fines, non plastic; damp.  PID = Oppm.	7		959	6 CB					
PID = Oppm.  PID = Oppm.  14.0 to 16.0 feet. SAND (SP); light grayish-brown; 100% send, fine; trace fines, trace organic debris, no noticeable odor, damp.  PID = Oppm.  16.0 to 18.5 feet. GRAVELLY SAND (SP); light grayish-brown; 70% sar fine; 30% gravels, fine to medium, subangular, trace fines; damp.  PID = Oppm.  18.5 to 22.0 feet. SAND (SP); dark yellowish-brown; 100% sand, fine; trace fines, non plastic; damp.  PID = Oppm.	8 9				PID = 0pp	m			
PID = Oppm.  PID = Oppm.  14.0 to 16.0 feet. SAND (SP); light grayish-brown; 100% send, fine; trace fines, trace organic debris, no noticeable odor, damp.  PID = Oppm.  16.0 to 18.5 feet. GRAVELLY SAND (SP); light grayish-brown; 70% sar fine; 30% gravels, fine to medium, subangular, trace fines; damp.  PID = Oppm.  18.5 to 22.0 feet. SAND (SP); dark yellowish-brown; 100% sand, fine; trace fines, non plastic; damp.  PID = Oppm.	10								num: 1000/ acad fine: frame
PID = Oppm.  PID = Oppm.  14.0 to 16.0 feet. SAND (SP); light grayish-brown; 100% send, fine; trace fines, trace organic debris, no noticeable odor, damp.  PID = Oppm.  16.0 to 18.5 feet. GRAVELLY SAND (SP); light grayish-brown; 70% sar fine; 30% gravels, fine to medium, subangular, trace fines; damp.  PID = Oppm.  18.5 to 22.0 feet. SAND (SP); dark yellowish-brown; 100% sand, fine; trace fines, non plastic; damp.  PID = Oppm.								fines; no noticeable odor, damp.	own, 100% sand, iine, iiace
20 80 801 801		POSE POSE POSE	100	CB				fines; trace gravels, fine to coarse; trace of	own; 100% sand, fine, trace organic debris; slight odor,
40 BO DOI DOI	13				PtD = Opp	m.			
20 80 801 801	14							14.0 to 16.0 feet: SAND (SP); light grayish-bri fines; trace organic debris; no noticeable	own; 100% sand, fine; trace odor; damp.
20 80 801 801									
20 80 801 801			100	СВ	<i>P!D</i> = 0pp	m.	, O.	16.0 to 18.5 feet: GRAVELLY SAND (SP); lig fine; 30% gravels, fine to medium, suban	ht grayish-brown; 70% sand gular; trace fines; damp.
40 BO DOI DOI	18						° 0 O		
40 BO DOI DOI	19				DID = 0	V222		18.5 to 22.0 feet: SAND (SP); dark yellowish- trace fines, non plastic; damp.	
LAND OF THE PARTY	20				rab = upp	***			MECEIVE
NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo lonization detector, soil head space reading in parts per million. 3. GW = groundy sampler, bestively indicates approximate screened interval. 4. bgs = below ground surface, 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waster.	NOTE	ES: 1. CB = 4x6-lindicates appr	nch core barr oximate scree	el soil sam	pler, 2. PID = Phot ral. 4. bgs = below	o ionizati ground s	on detector, soil urface. 5. PVC	I head space reading in parts per million. 3. GW = gr C = poly vinyl chloride. 6. Odor characteristic of manu	roundwale Namele, pashed pro- rectured gas plant waste.

<i>l</i> lau	I Foster &	Alongi,	inc.		Project N 8128.0		er	Well Number Sheet WS-14 2 of 11
(SS)	Well Details	11 a	S Son	ample D	eta	و.	gic	Soil Description
(feet, BGS)		Interval Percent Recovery	Collection Method to	Number	Name (Type)	Blows/6	Lithologic Column	
04								
21		100	CB					
22				F	21D = 0ppm.		mmmt	22.0 to 22.5 feet: SILT (ML); light brownish-gray; 85% fines, low plasti
23								15% sand, fine; trace gravels, fine to medium, subrounded; trace organic debris; trace woody debris; damp. 22.5 to 23.5 feet: SAND (SP), dark yellowish-brown; 100% sand, fine;
24		100	СВ				W DIST	trace fines, non plastic; damp.  23.5 to 26.0 feet: GRAVELLY SILT (ML); light grayish-brown; 65% fine
25								medium plasticity; 35% gravels, fine to coarse, subangular, trace send; moist.
				F	PID = 0ppm.		1	
26		100	СВ				1. Cd J.	26.0 to 29.0 feet: GRAVELLY SILT (ML); dark brownish-gray; 65% fire medium plasticity; 35% gravels, fine to coarse, subengular, trace
27								sand; strong sheen and odor; possible product; moist.
28				PIL	D = 29.7ppn	ı.		
29								
30								29.0 to 33.0 feet: SANDY SILT (ML); dark brownish gray; 65% fines, it plasticity, 35% sand, fine; heavy sheen and odor, tamy-like impact possible product; moist.
								,
31		100	СВ	PI	ID = 8.1ppm			
32								
33				P	24D = 0ppm.			33.0 to 35.0 feet: SiLTY SAND (SM); dark grayish-brown; 40% fines, plasticity, 60% sand, fine; subrounded clast approximately 5-inch
34								plasticity; 60% sand, fine; subrounded clast approximately 5-inch diameter; heavy sheen and odor; moist.
35								
36				P	PID = 0ppm.		***	35.0 to 35.5 feet: SAND (SP); light yellowish-brown; 100% sand, fine; fines, non plastic; heavy sheen and odor; moist.
,,,		90	CB					35.5 to 38.5 feet: SAND (SP); dark brownish-gray, 100% sand, tine; tr fines, non plastic; heavy sheen and odor; globules; moist to wet.
37								
38				F	PLD = Oppm.			
39								38.5 to 52.5 feet SILTY SAND (SM); dark brownish-gray; 25% fines, to low plasticity, 75% sand, fine; trace gravels, subangular, strong
40								odor, wet.
41								
		100	CB	F	PID = 8ppm.			other state Alle State & B. D. Date &
42								RECEIVED
ЮТЕ	S: 1. CB = 4x6-inc indicates approx	ch core barrel : ximate screen	soil sam ed interv	pler. 2. F al. 4. bg	PID = Photo io. s = below gro	nizatioi ınd sui	n detector, soil rface. 5. PVC	head space reading in parts per million. 3. GW = group thinger sample, classed = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.
								WATER RESOURCES

laı	ul Foster &	Alor	ngi,	Inc.		Project N 8128.0		er	Well Number WS-14	Sheet 3 of 11
3GS)	Well Details	Je	nt dery	Story	emple			ogic 10	Soil Description	
(feet, BGS)		Interval	Percent	Collection Method o	Number	Name (Type)	Blows/6	Lithologic Column		
43										
44						D/D = 0 = ==				
45						PID = Oppm.				
16										
47						PID = Oppm.				
48		T.								
49										
50						PID = 0ppm.				
51				1						
52										
53									52.5 to 53.0 feet: SILT (ML); dark brow	vnish-gray; 90% fines, low plastici
						PID = 0ppm.			10% sand, fine; strong odor; moist 53.0 to 55.5 feet: SILTY SAND (SM); o to low plasticity; 75% sand, fine; tr	dark brownish-gray; 25% fines, no
54									odor; wet.	
55										
56		-	100	СВ		PID = 0ppm.			55.5 to 56.0 feet: SILT (ML); dark brow 10% sand, fine; strong odor; moist 56.0 to 58.0 feet: SAND WITH SILT (S	to wet.
57									fines, non plastic; 85% sand, fine;	strong odor; wet.
58									58.0 to 66.0 feet: SILTY SAND (SM); c	last hoursich cray 15 to 2004 for
59									non to low plasticity; 75 to 80% sa strong odor, wet.	and, fine; trace cobbles, subround
50						PID = Oppm.				
51									@ 60.0 feet: 3-inch silt layer.	
		1	90	CB						
52						PID = Oppm.				
53										
54						31			@ 63.5.0 feet: odor becoming slight.	BEAGUES
5 <u>5</u>	DOL TOO DO									RECEIVED
ЮТ	ES: 1. CB = 4x6-ir indicates appro	nch core oximate	barrel . screen	soli sam ed interv	pler. 2. rel. 4. i	. PtD = Photo lo bgs = below gro	nizatio und su	n detector, soi aface. 5. PVC	il head space reading in parts per million. 3. C = poly vinyl chloride. 6. Odor characteristic	GW = grounglyegter Symple, costing of of menufactured gas-plant waste.
										WATER RESOURCES D

laı	ul Foster & /	Alongi	, Inc	•	Project N 8128.0		er .	Well Number She WS-14 4 of	
GS)	Well Details		. 8.	Sample			98.	Soil Description	
(feet, BGS)	Delalia	Interval	Collection	Number	Name (Type)	Blows/8	Lithologic Column		
					PID = 0ppm.				
66		100	CE					66.0 to 67.0 feet: SANDY SILT (ML.); dark grayish-brown; 8 to low plasticity; 20% sand, fine; micaceous; moderate	0% fines, n
67								wet. 67.0 to 69.5 feet: SAND (SP); dark gravish-brown; 5% fines	s, non plasti
68					PID = 0ppm.			95% sand, fine; micaceous; no noticeable odor; moist t @ 68.0 feet: 2-inch sit layer.	io wet.
69								•	
70								69.5 to 70.0 feet: SILT (ML); dark gray; 85% fines, low plast sand, fine; moist.	ticity; 15%
71								70.0 to 71.0 feet: SAND (SP); dark grayish-brown; 5% fines 95% sand, fine; micaceous; moist to wet.	s, non plast
		0	CE		PID = 0ppm. WS14-W-71		pinane (at 1524)	71.0 to 75.5 feet NO RECOVERY.	· — · · · · · ·
72									
73									
74									
75									
76		100	CE		PID = 9.4ppm			75.5 to 81.5 feet: SAND (SP); dark brownish-gray, trace to plastic; 95 to 100% sand, fine; micaceous; slight odor; of the same statement of the same state	5% fines, n
77								prasin, eo io 10070 seno, irro, milotocous, signi cour, l	
78		100	CE		PID = Oppm.				
79								@ 79.0 feet: trace silty balls.	
30	PSS4 PSS4 PSS4								
31					num a				
32					PID = Oppm.			81.5 to 82.5 feet: SILT (ML); dark gray; 90% fines, medium	plasticity, 1
								sand, fine; slight odor; wet 82.5 to 83.5 feet: SAND (SP); dark gray; 100% sand, fine; t	race fines;
33							mmmm	moderate odor, wet.  83.5 to 84.3 feet: SILT (ML); dark gray, 90% fines, medium.	
34					PID = Oppm.			sand, fine; slight odor; wet. 84.3 to 84.5 feet: SAND (SP); dark gray; 100% sand, fine; the same sand, fine; the	
35								moderate odor; wet.  84.5 to 85.0 feet SAND and SILT (SP-Mt) dealers by the sand and silt layers; wet.	
36					WS14-W-86			85.0 to 87.5 feet. SAND (SP); dark gray; 10% fines, non ple	astic; 90% s
37								JAN 23 2	015
	POST POST POST				PID = Oppm.			WATER RESOURCE	
ЮП	indicates approx	on core barr dimate scree	ened inte	mpier. 2 irval. 4.	z. PID = Photo io bgs = below gro	nızatici und su	n detector, so rface. 5. PV	l head space reading in parts per milion. 3, GWS Arbundwele Sum C = poly vinyt chloride. 6. Odor characteristic of manufactured gas pl	ipie, vräshed lant waste.

vial	ul Foster & /	1101	ıyı, ı	IIIG.		Project N		21	Well Number	Sheet
13	Well	T		- Se	mple	8128.0 Data	71.08		WS-14 Soil Description	5 of 11
Depth (feet, BGS)	Details	Interval	Percent Recovery	Collection Method &	Number	Name (Type)	Blows/6"	Lithologic Column		
88 89 90			100	CB					87.5 to 88.0 feet: SANDY SILT (ML); gray; 60% fi plasticity; 40% sand, fine; micaceous; modern 88.0 to 89.5 feet: SILTY SAND (SM); gray; 15% fi sand, fine; micaceous; slight odor; wet. 89.5 to 90.5 feet: SILT (ML); dark gray; 100% fine trace sand, fine; micaceous; moist	ate odor, wet. nes, non plastic; 85%
91						PID = 13ppm			90.5 to 92.0 feet: SILTY SAND (SM); gray; 15% fi sand, fine; micaceous; sheen and strong odo	nes, non plastic; 85% r, wet
92 93					,	4D = 28.3ppn			92.0 to 96.0 feet: SILT (ML); gray; 100% fines, m trace sand, fine; micaceous; sheen and stron zones of 2-inch pockets with fine sand.	edium to high plasticity g odor, moist. Severa
94 95		THE REAL PROPERTY.			•	word popular				
96			100	СВ		PID = 0ppm.			96.0 to 98.0 feet. SANDY SILT (ML); dark gray; 8	5% fines, medium
97		0							plasticity; 15% sand, fine; micaceous; strong	oaor, moist.
98						PID = Oppm.		. [. L. Ł.	98.0 to 102.0 feet: SAND (SP); dark gray; 5% fine fine; micaceous; strong odor; wet. Between 9 1/2-inch sitt bands intermixed with sand.	s, non plastic; 95% se 19.0 and 99.5 feet sevi
00						WS14-W-101			@ 100.5 feet: 1-inch silt layer.	
02 03	fog log log	No. of Concession, Name of Street, or other Persons, Name of Street, or ot	100	CB		PID = Oppm.			102.0 to 105.0 feet: SAND (SP); gray; 100% sand fines; sheen and strong odor, wet.	d, fine; micaceous; trad
04 05	5249.5 5249.5					PID = 84ppm.			105.0 to 105.5 feet SILT (ML); gray; 90% fines. k	ow olasticity 10% san
06 07		The state of the s							fine; strong odor, moist.  105.5 to 106.0 feet: SAND (SP); gray; 100% sand fines; sheen and strong odor, wet.  106.0 to 108.0 feet: SILT (ML); gray; 100% fines;	d, fine; micaceous; trad
08						PID = 9.5ppm		SEXE	fine; trace rootlets; moderate odor; moist.  ② 107.0 feet: 2-inch gray sand layer with stong of 108.0 to 108.5 feet: SILTY SAND (SM); gray 36	
09 10		1						44.	sand, fine; sheen and strong odor, wet. 108.5 to 110.5 feet: SILT (ML); gray, 100% fines; fine; sheen and strong odor, moist. @ 109.0 feet: 4-inch silty sand layer with sheen a	low plasticity; trace sa
VOTI	ES: 1. CB = 4x6-inc indicates approx	th core	barrel s	soll samp ad interv	oler. 2 al. 4. I	PID = Photo ici bgs = below grou	nizatio und su	n detector, soi rface. 5. PVC	I head space reading in parts per million. 3. GW = groun C = poly vinyl chloride. 6. Odor characteristic of making	Water sample, usche g Who Odd Boy Olyste.

Mau	ıl Foster &	Alor	ngi, I	nc.		Project I 8128.0		er	Well Number Sheet WS-14 6 of 11
(\$5)	Well	T	. >	S Se	mple			Į,	Soil Description
Depth (feet, BGS)	Details	interval	Percent Recovery	Collection	Number	Name (Type)	Blows/6	Lithologic Column	
111		-	100	СВ		PiD = Oppm.			110.5 to 111.0 feet: SAND (SP); gray; 100% sand, fine; micaceous; tr fines; slight odor; wet 111.0 to 113.0 feet: NO RECOVERY; sluff.
113						PID = Oppm.			113.0 to 114.0 feet: SANDY SILT (ML); dark brownish-gray; 60% fine non to low plasticity; 40% sand, fine; micaceous; faint odor, moist wet.
115									114.0 to 120.5 feet: SAND (SP); dark brownish-gray; 5% fines, non p. 95% sand, fine; micaceous; no noticeable odor; wet.
116						PID = Oppm.			@ 116.0 feet: 3-inch silt layer.
118 119									
						PID = Oppm.			
120			400	CD		WS14-W-120			120.5 to 121.0 feet: SILT (ML); dark brownish-gray, 85% fines, low plasticity; 15% sand, fine; micaceous; molst.
122 123			100	CB					121.0 to 132.5 feet: SAND (SP); dark gray, 100% sand, fine; trace fine micaceous; wet.
124 125	action be					PID ≃ Oppm.			@ 124 feet: sheen and strong odor present.
126									
127 128						PID = Oppm.			
129 130 131 132 NOTE									RECEIVE
131						PID = Oppm.			@ 130 feet: sheen and strong odor fading.  JAN 2 3 201
132	0000 00 00000 00 00000 00 00000 00								WATER RESOURCES SALEM, OREGO
NOTE									il head space reading in parts per million. 3. GW = groundwater sample, dashec C = poly virnyl chloride. 6. Odor characteristic of manufactured gas plant waste.

	I Foster & A		.9.1			Project I 8128.			Well Number Sheet WS-14 7 of 11
Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method o	Numberdune	Name (Type)	Blows/6"	Lithologic Column	Soll Description
_133	10000 00 50500 00 10000 00 10000 00					PID = 0ppm.			132.5 to 133.5 feet: SILT (IML); dark grayish-brown; 90% fines, low plasticity; 10% sand, fine; micaceous; moist.
134	5000 00 00000 00 00000 00								133.5 to 134.0 feet: SAND (SP); dark gray; 100% sand, fine; trace fine micaceous; wet. 134.0 to 134.5 feet: SILT (ML); dark gray/sh-brown; 90% fines, low
_135	00000 00 00000 00 00000 00								plasticity; 10% sand, fine; micaceous; moist.  134.5 to 136.0 feet: SAND (SP); dark gray; 100% sand, fine; trace fine micaceous; wet.
136	00000 00 00000 00 00000 00		U	СВ					@ 135.5 feet: 3-inch sift layer. 136.0 to 138.5 feet: NO RECOVERY.
137	10100 00 10100 00 10100 00								
_138	00000 00 00000 00 00000 00		100	СВ				0.5550.0550	138.5 to 141.5 feet: SAND (SP); dark gray, 5% fines, non plastic; 95%
_139			100	۵		PID = Oppm.			sand, fine; micaceous; slight odor; wet.
140	rioned riv								
142									141.5 to 142.0 feet: SILT (ML); dark brownish-gray; 85% fines, low plasticity; 15% sand, fine; micaceous; moist.
143			100	CB		PID = 0ppm. WS14-W-142		***	@ 141.7 feet: 1-inch sand layer. 142.0 to 143.0 feet: SAND (SP); gray; 100% sand, fine; trace fines; we
144									143.0 to 145.0 feet: SiLT (ML); gray; 100% fines, medium to high plasticity; trace sand; moist.  @ 143.5 feet: 3-inch sand layer.
145						PID = 0ppm.			145.0 to 148.5 feet: SILT (ML); gray; 100% fines, medium to high plasticity; intermixed with 1-inch to 2-inch sand layers; moist.
146									
_148									
_149						PID = Oppm.			148.5 to 149.0 feet: SAND (SP); gray; 100% sand, fine; trace fines; we
_150			100	СВ				ттт. Тттт	plasticity; trace sand; moist. 149.5 to 150.0 feet: SAND (SP); gray, 100% sand, fine; trace fines; we
151			,,,,			WS14-W-150			150.0 to 167.0 feet: SAND (SP); gray, 5% fines, non plastic; 95% sand fine to medium; trace wood debris; wet.
152 153 154 155 NOTES						PID = 0ppm.			@ 152.0 feet 2-inch silt layer. RECEIVED
153									JAN 23 2015
154									WATER RESOURCES DEPT SALEM, OREGON

Maul Foster & Alongi, Inc.			Inc.	Project Number				Borehole Log/Well Constructi	Sheet	
			3-,			8128.0			WS-14	8 of 11
Depth (feet, BGS)	Well Details	val	Percent Recovery	Collection Method go	ample §		.9/s/	Lithologic Column	Soil Description	
(feet		Inforval	Rec	Colli	Number	Name (Type)	Blows/6	Color		
						PID = 0ppm.			@ 155.0 feet: Wood fragments.	
156										
						1				
_157									@ 157.0 feet: 3-inch silt layer.	
158						!!				
						PtD = Oppm.				
159										
460										
160										
161										
	0000000000 000000000 000000000					PID = 0ppm.				
162										
163	00000000									
103	00000000									
164	1010101010 000101010								*	
	00000000					PID = 0ppm.				
165									^	
166	00000000									
_100	20000000									
167	10101010101010101010101010101010101010		400	00					167.0 to 167.5 feet NO RECOVERY; sluff.	
			100	CB		PID = 0ppm. WS14-W-167			167.5 to 169.5 feet: SAND (SP); gray; 100% sand,	fine: micaceous: frace
_168	000000000								fines; wet	
169										
170	101000000 010100000 00100000					PID = 0ppm.			169.5 to 172.0 feet: SAND (SP); gray; 100% sand, increasing fines to 15%; wet	tine; micaceous;
171	00000000000000000000000000000000000000					- oppin				
_	00000000000000000000000000000000000000								4	
172	50505050							er gro fre er e		
_172 _173 _174 _175 _176 _177	00000000000000000000000000000000000000								172.0 to 173.0 feet: SILTY SAND (SM); gray; 35% sand, fine; wet.	fines, non plastic; 65%
_173					l	PID = Oppm.		111	173.0 to 182.0 feet. SAND (SP); gray; 100% sand,	fine; micaceous; trace
174	00000000								fines; wet	
	00000000000000000000000000000000000000								RECE	VED
_175	00000000000000000000000000000000000000									
	00000000 00000000 000000000								JAN 23	2015
_176	000000000					PID = 0ppm.			WATER RECO	5650 ps==
177	000000000 000000000								WATER RESGU SALEM, OI	HUES DEPT REGON
	00000000 00000000 00000000		100	CB					, 01	

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionixation detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

GBLWC W: GINT'GIN

	Maul Foster & Alongi, Inc.			Project Number 8128.01.08				WS-14	9 of 11	
Depth (feet, BGS)	Well Details	Interval	Recovery	Coffection Method co	ample	Data Name (Type)	on			
178	00000000000000000000000000000000000000									
179	00000000 00000000000000000000000000000					PID = Oppm.				
180	000000000 00000000 000000000 000000000									
81										
82	50000000000000000000000000000000000000	+	30	СВ		PID = 0ppm. WS14-W-182		<u> </u>	182.0 to 185.5 feet NO RECOVERY; s	luff.
83	10101010 516161616 10101016 10101016 10101016									
84	00000000 000000000 000000000									
85	00000000 00000000 00000000 00000000							32700.0000	185.5 to 186.5 feet: Sand (SP); gray; 10	00 % sand, fine, micaceous; trace
	1010101010 1010101010 1010101010					PID = Oppm.			fines; wet.  186.5 to 188.0 feet: SILTY SAND (SM)	
87 88	5,7 5,7 5,7 5,7 5,7 5,7 5,7 5,7 5,7 5,7								sand, fine; wet.	
89	10101010 1010101010 1010101010								188.0 to 190.0 feet: SILT (ML); gray; 1 damp.	00% fines, low to medium plastic
90						PID = Oppm.			@ 189.0 feet: 2-inch fine, sand layer.	
91	00000000 00000000 00000000000000000000			-					190.0 to 195.0 feet: SAND (SP); gray; fines; wet.	100% sand, fine; micaceous; trac
92	00000000000000000000000000000000000000									
	10 10 10 10 10 10 10 10 10 10 10 10 10 1	1	00	CB		PID = Oppm.				
94										
95	1010101010 010101010 1010101010 01010101010					PID = Oppm.			195.0 to 196.0 feet: SILTY SAND (SM)	romer 5094 fines munissirity 5
95 96	00000000 00000000 00000000 00000000					- no - uppath			sand, fine; wet.  196 0 to 197.0 feet: SAND (SP); gray;	
97	1010101010 0101001010 1010101010 1010101010	-	90	СВ		WS14-W-197			fines; wet 197.0 to 198.0 feet: SILT (ML); gray; 1	
97 98 99 90 VOTE	5,6,6,6,0,0 ,0,0,0,0,0 ,0,0,0,0,0 ,0,0,0,0					PID = 0ppm.			plasticity; damp.  198.0 to 204.0 feet: SAND (SP); gray;	
99	10 10 10 10 10 10 10 10 10 10 10 10 10 1								micaceous; trace tines; wet.	ATER RESOURCES DEP SALEM, OREGON
00	00000000 00000000 00000000									OALEM, CHEGON

W:KGINTIGINTWAPROJECTS/B128-01/WS14-17, GPJ 4/13/07

GBLWC

161.0 to 210.0 feet bgs: non-IPA coated, 1/4-inch bentonite pellets

JAN 23 2015

hydrated with potable water.

						logic Borehole Log/Well Construction				
Maul	Foster & A	97	Numbe .01.08	r	Well Number WS-14	Sheet 11 of 11				
Depth (feet, BGS)	Well Details	Interval Percent Recovery Collection Method go	Ample Data	Blows/6"	Lithologic Column	Soil Description	n			

Well WS14-125: 0.0 to 109.0 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe. 109.0 to 124.0 feet bgs: 2-inch diameter, stainless steel wire wrapped screen, 0.010-slot.

124.0 to 125.0 feet bgs: 2-inch diameter, stainless steel sump.

Well WS14-161:
0.0 to 145.0 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe
145.0 to 160.0 feet bgs: 2-inch diameter, stainless steel wire wrapped
screen, 0.010-slot.
160.0 to 161.0 feet bgs: 2-inch diameter, stainless steel sump.

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WATER RESOURCES DEPT

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PtD = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly viryl chloride. 6. Odor characteristic of manufactured gas plant waste.

## ATTACHMENT C

**OWRD WELL LOGS** 

RECEIVED

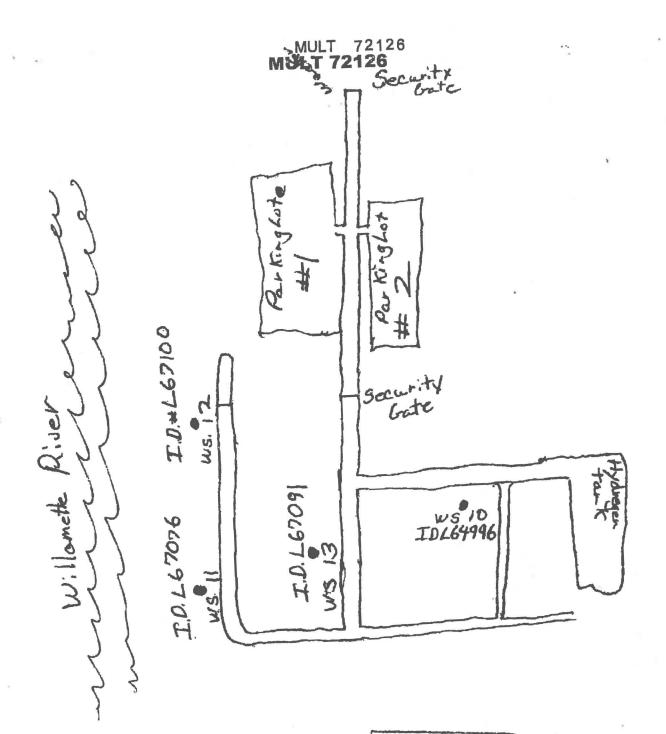
JAN 23 2015

WATER RESOURCES DEPT SALEM, OREGON



STATE OF OREGON MONITORING WELL REPORT	14266
(as required by ORS 537.765 & OAR 690-240-095)	Start Card # 10147655
Instructions for completing this report are on the last page of this form,  (1) OWNER/PROJECT: WELL NO. W. S. ()	(6) LOCATION OF WELL By legal description
Name Wac Ker Siltronic Cop	Well Location: County Multhand h Township / N (Nor S) Range / W (E or W) Section / 3
Address 2200 N.W Front Ave. City Portland State Ov Zip 97210	1 611 14 of Cts 11 11 of change coming
(2) TYPE OF WORK:	2. Either Street address of well location. 7200 NW
	Front Ave Portland Or.
New construction Alteration (Repair/Recondition)	or Tax lot number of well location 1200
Conversion Deepening Abandonment	<ol> <li>ATTACH MAP WITH LOCATION IDENTIFIED. Map shall include approximate scale and north arrow.</li> </ol>
(3) DRILLING METHOD	(7) STATIC WATER LEVEL:
☐ Rotary Air ☐ Rotary Mud ☐ Cable	27.4 Ft. below land surface. Date 10-20-63
Hollow Stem Auger Other San C	Artesian Pressure 1b/sq. in. Date
BORE HOLE CONSTRUCTION	(8) WATER BEARING ZONES:
Yes No	Depth at which water was first found
Special Standards M Depth of completed well 23 ft.	From 16 Est. Flow Rate SWL
Vault (	KECEIVED
R. Water-tight cover	
Surface flush vault	JUL 0.6 2004
Locking cap	(9) WELLLOG: Ground elevation WATER RESOURCES DEP
Casing Casing diameter 2 in.	CALEN COTOCH
De C material P.U.C	Material Proma To SWL
Welded Threaded Glued	Sala Light-Brown 1 30
Seal College Of Liner	Sitt with Lover of 30
Seal Liner diameter hon- in.	
DD BD material	Sand Black with 52
70 JOSO Welded Threaded Glued	Laxer doit 187
104 ft. Well seal:	Sity Grave 187 203 Basalt 203 205
Material Bearing (Fran	J Basair 200
1090 Amount 1950 163	
Grout weight # 10,0	
Borehole diameter	
Bentonite plug at least 3 ft. thi	RECEIVED F
DP 31 Screen	
Filter pack material 34, 4, 5	DEC 1 0 2003
104. 100 E 100 From 109 To 124	WATER RESOURCES OPPT SALEM, OREGON
TO TO TO TO	SALEM, OREGON,
25 ft. Slot size 10 in.	
Filter pack:	
Grand Board Sire 10-2-0 in	Date started 9-2/-03 Completed 10-2/-03
7207' Gasa   Gasa Size 10-20 in.	(unbonded) Monitor Well Constructor Certification:
5) WELLTEST:	<ul> <li>I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction</li> </ul>
Pump Bailer Air Flowing Artesian	standards. Materials used and information reported above are true to the best
Permeability Yield GPM	MACHIMINE TO 14
Conductivity 576 Usen PH 4.73 Temperature of water 1602 F/C Depth artesian flow found ft.	Signed Date
Temperature of water 16.0 2°F/C Depth artesian flow found ft.  Was water analysis done? Yes XNo	(banded) Monitor Well Constructor Certification:
By whom?	I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All
Depth of strata to be analyzed. Prom ft. to ft.	work performed during this time is in compliance with Oregon well construction
Remarks:  Name of supervising Geologiss/Engineer Man Factor 3 Along i	standards. This report is true to the best of my knowledge and belief.
ORIGINAL & FIRST COPY-WATER RESOURCES DEPARTMENT	T SECOND COPY-CONSTRUCTOR THIRD COPY-CUSTOMER
	JAN 2 3 2015

PARTIC OF OREGON  MONTTORING WELL REPORT (as required by ORS 537:76 & OAR 69-240-98)  Start Card # W 147 6.55  Start Card	STATE OF OREGON D MULT	72126
Conversion   Companies   Conversion   Conve	MONITORING WELL REPORT (set required by ORS 537.765 & OAR 690-240-095)	72129 D4 L6/P3
Well Location Control Contro		Start Card # W 17/600
Advantage   Acception   Acce		(6) LOCATION OF WELLBy legal description
Conversion   Alter top (Recognity Recognity Recognity)   Assertance   Conversion   Deposition   Alter top (Recognity Recognity)   Assertance   Conversion   Deposition   Dep	Name Wacker	Well Location: County hutnomas
Convertinction	A 1/	Township N (N or S) Range W (E or W) Section 3
New construction		
Conversion   Deepening   Abandonnest   Aba	(a) The division of the divisi	
(3) DRILLING METHOD    Retury Air   Retury A	New construction Alternton (Repair Recondition)	
SALEM ORSON		3. ATTACH MAP WITH LOCATION IDENTIFIED. Map shall include approximate scale and north arrow.
Rotary Air   Rotary Mad   Cable   Artesian Pressure   Ibriga, in. Date   Ibriga, in. Da	(3) DRILLING METHOD SALEM, OREGON	
Hollow Stem Ager   Golber   Artistain Pressure   Ibide its   Duse	Rotary Air Rotary Mud Cable	22.9 Ft. below land surface. Date 10-20-03
Special Standards	Hollow Stem Auger Other	Artesian Pressure lb/sq. in. Date
Special Standards	BORE HOLE CONSTRUCTION	(8) WATER BEARING ZONES:
Mult On Remarks:    Material procession of the control of the cont	Yes No	
Where tight cover Surface flush wall Locking ap  Casing diameter Method Threaded Gloed Well and Threaded Gloed Liner diameter Method Threaded Gloed Well and Liner Method Threaded Gloed	Special Standards Depth of completed well ft.	
Water-light cover Surface flush vault Locking as Casing Ca		145 160 .75 27.9
Sorface flush vault Locking eap  Casing 2  Gaineter 1  Nelded Threaded Gload  Welded Threaded Gload  Line		
Casing 2 in. material 3 in. material		
Seal   12.5 ft.   Seal	12 ft. 2 Locking cap	(A) HIDEL LOC
Material   Prom   To   SWL   Set   Swall   S		
Seal   12.5 ft.   Seal   S	LYSINGALLIN ALLINESS SEE	
Liner   diameter   n   N   in.   material   well ded   Threaded Glood	07.00 \$11110 111100 00	
diameter none in material welded Threaded Glood well seal:  Material behavior of the construction alteration, or abandoment of this well is in compliance with Oregon well construction, alteration, or abandoment of this well is in compliance with Oregon well construction, alteration, or abandoment of this well is in compliance with Oregon well construction alteration, or abandoment of this well is in compliance with Oregon well construction alteration, or abandoment of this well is in compliance with Oregon well construction alteration, or abandoment of this well is in compliance with Oregon well construction alteration, or abandoment of this well is in compliance with Oregon well construction alteration, or abandoment of this well is in compliance with Oregon well construction alteration, or abandoment of this well is in compliance with Oregon well construction alteration, or abandoment of this well is in compliance with Oregon well construction alteration, or abandoment of this well is in compliance with Oregon well construction alteration, or abandoment of this well is in compliance with Oregon well construction alteration, or abandoment of this well is in compliance with Oregon well construction alteration, or abandoment of this well is in compliance with Oregon well construction alteration, or abandoment of this well is in compliance with Oregon well construction alteration, or abandoment of this well is in compliance with Oregon well construction alteration, or abandoment of this well is in compliance with Oregon well construction alteration, or abandoment of this well is in compliance with Oregon well construction alteration, or abandoment of this well is in compliance with Oregon well construction alteration, or abandoment of this well is in compliance with Oregon well construction alteration, or abandoment of this well is in compliance with Oregon well construction alteration and abandoment of this well is in compliance with Oregon well construction alteration and abandoment of this well is in complianc	- 10.0.5 ANIIIV AIIIVO:0.51	
Material   Well dead   Threaded Glove   Single		
Well seal:  Material Seal:  Ma	Car Calling Millian Call	Sand Black with 52
Well seal:   Material   Materia	TO JORG Welded Threaded Glued	
Material Amount 200   155   Grout weight   10.0   Borchole diameter   In.   Bentonite plug at least 3 ft. thick   Screen   Material 3 ft.   Less   In.   In.	JUD a CORD WALL CON	
Amount 200 155 Grout weight 10.0 Borehold diameter in. Bentonite plug at least 3 ft. thick Screen materials 71.0 16.0 From 10 Slot size 10 in. Filter pack: Material 30.0 in. Filter pack:	OB B Material Beneficial	must be a second
Borehole diameter   in.   Bentonite plug at least 3 ft. thick   Screen   Material   Filter pack   Stock   St	200 185 Amount 200 185	5
Filter pack    Air		
Filter pack   Screen   material   Filter pack   Screen   To   From   To   From   To   Stot size   O in.   Filter pack   Size   O -20 in.   Size		
material Statules interval(s):    Hot.   From   45   To   60		ft. thick
interval(s): From 10    161 ft.   162   163   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   164   16	Dan Screen	Well was Back Filled with
From   45 To   60	Pack (O) SIGNATURE CONTROL OF	50 control Boutonite of 16th
Solution		) From 161 75 207
Filter pack:     Date started   Completed   D - D - D	ro 〈 COND 目 COND From To	
Date started Completed 10-71-03    Completed 10-71-03		
(unbonded) Monitor Well Constructor Certification:  I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to the best knowledge and belief.  Was water analysis done? Yes No  By whom?  Depth of strata to be analyzed. From ft. to ft. Remarks:  (unbonded) Monitor Well Constructor Certification:  I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to the best knowledge and belief.  Signed Date  Conductivity Yes No  I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction alteration, or abandonment work performed during this time is in compliance with Oregon well construction.  I accept responsibility for the construction, alteration, or abandonment work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.  WATER MECOLUMBOLES DEPT		Date started Completed 10-21-03
I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to the best knowledge and belief.    No	123 14 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	
abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to the best knowledge and belief.    MWC Number   Signed   Date	C 6.00.04	
Permeability Yield 75 GPM		abandonment of this well is in compliance with Oregon well construction
Conductivity 45 USOM PH 6.6 Signed Date  Temperature of water 65.20 °FC Depth artesian flow found ft.  Was water analysis done? Yes No (bonded) Monitor Well Constructor Certification:  I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction days seponted above. All work performed during this time is in compliance with oregon well construction standards. This report is true to the best of my knowledge and belief.  WATER MYCOUNDOCES DEPT		knowledge and belief
Was water analysis done? Yes No  By whom?  Depth of strata to be analyzed. From ft. to ft. to ft. to standards. This report is true to the best of my knowledge and belief.  WATER MYCOUNDOCES DEPT	Conductivity 45/ US/OM PH 6.61	
Was water analysis done? Yes No  By whom?  Depth of strata to be analyzed. From ft. to ft. Remarks:  (bonded) Monitor Well Constructor Certification:  I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction days seponted above. All work performed during this time is in compliance with oregon well-construction standards. This report is true to the best of my knowledge and belief.  WATER MYCOUNTERS DEPT		Tr. RECEIVED
Depth of strata to be analyzed. From ft. to nt.  Remarks: work performed on this well during the construction large separated above. All work performed during this time is in compliance with oregon well construction standards. This report is true to the best of my knowledge and belief.  WATER MYCOUNTER DEPT		(bonded) Monitor Well Constructor Certification:  I accept responsibility for the construction, alteration, or abandonment
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	No control of the All	CALEM OREGON
Name of supervising Geologist/Engineer CALDING SALDING OFFICE AND SIGNAL & FIRST COPY-WATER RESOURCES DEPARTMENT SECOND COPY-CONSTRUCTOR THIRD COPY-CUSTOMER		



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DEC 1 0 2003

WATER RESOURCES DEPT SALEM, OREGON

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JAN 23 2015

WATER RESOURCES DEPT SALEM, CREGON

#### **MULT 72126**



Water Resources Department
Commerce Building
158 12th Street NE
Salem, OR 97301-4172
503-378-3739
FAX 503-378-8130

September 2, 2003

MARK KNOLLE #10437 C/O PROSONIC CORP 305 E. COMSTOCK DR CHANDLER AZ 85225

#### FINAL ORDER

Dear Mr. Knolle:

The special standard request you submitted for owner: Wacker Siltronic, start card numbers 147653-147655 is approved for the following: multiple completion wells, the wells will have two (2) 2 inch wells in each borehole. See Oregon Administrative Rule (OAR) 690-240-0410(5). Your special standard request form is enclosed.

The Well Construction Standards serve to protect ground water resources. By approving and issuing this special construction standard the Oregon Water Resources Department is not representing that a well constructed in accordance with this condition will maintain structural integrity or that it meets engineering standards. The well constructor/or landowner is responsible for ensuring that a well is constructed in a manner that protects ground water resources as required under Oregon Administrative Rules 690-200 through 690-240.

If you have any questions concerning this letter, I may be contacted at (503) 378-8455 ext 283, or by e-mail at tracy, leichenlaub@wrd.state.or.us.

Sincerely,

Ms. Tracy Eichenlaub
Well Construction Specialist

Enforcement Section

enclosure

cc: Dorothy Pedersen, NW Region Monitor Well Inspector

This is a final order in other than a contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review of the order must be filed within the 60 day time period specified by ORS 183.484(2). Pursuant to ORS 536.075 and OAR 137.004-0080 and OAR 690-01-0005 you may either petition for judicial review or petition the Director for reconsideration of this order.

JAN 2 3 2015

#### **MULT 72126**



**Water Resources Department** 

Commerce Building 158 12th Street NE Salem, OR 97301-4172 503-378-3739 FAX 503-378-8130

October 6, 2003

MARK KNOLLE #10437 C/O PROSONIC CORP 305 E. COMSTOCK DR CHANDLER AZ 85225

#### FINAL ORDER

Dear Mr. Knolle:

The special standard request you submitted for owner: Wacker Siltronic, start card number 147655 is approved for the following: use of bentonite below 50 feet and through more than 25 feet of water, 3/8 inch bentonite pellets will be used to abandon the bottom of the hole from 206 feet to 160 feet. See Oregon Administrative Rule (OAR) 690-240-0475(3). Your special standard request form is enclosed.

The Well Construction Standards serve to protect ground water resources. By approving and issuing this special construction standard the Oregon Water Resources Department is not representing that a well constructed in accordance with this condition will maintain structural integrity or that it meets engineering standards. The well constructor/or landowner is responsible for ensuring that a well is constructed in a manner that protects ground water resources as required under Oregon Administrative Rules 690-200 through 690-240.

If you have any questions concerning this letter, I may be contacted at (503) 986-0851, or by e-mail at tracy.l.eichenlaub@wrd.state.or.us.

Sincerely.

Mrs. Tracy Eichenlaub
Well Construction Specialist

Enforcement Section

enclosure

cc: Dorothy Pedersen, NW Region Monitor Well Inspector

This is a final order in other than a contested case. This order is subject to judicial review under ORS 183.484.

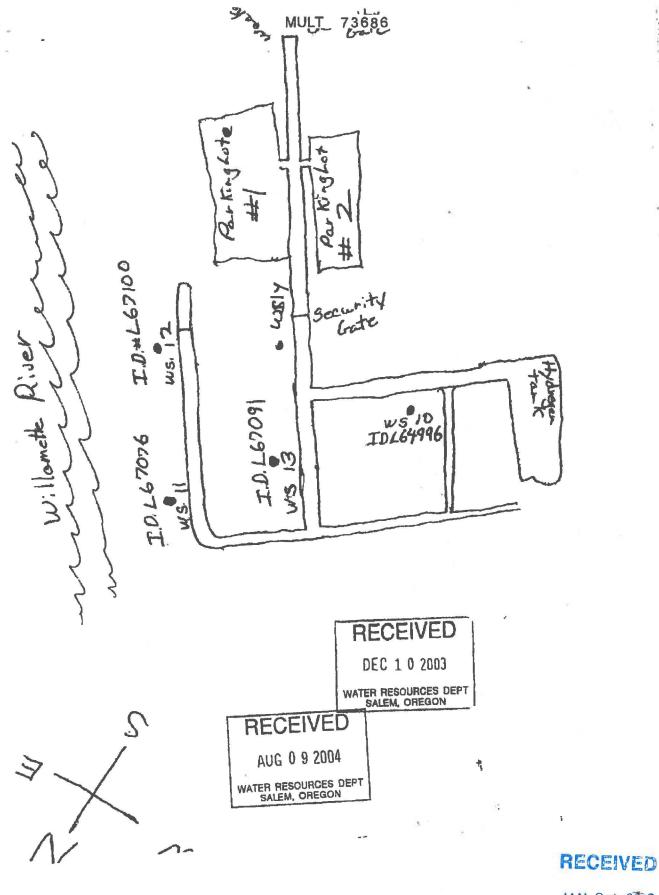
Any petition for judicial review of the order must be filed within the 60 day time period specified by ORS 183.484(2). Pursuant to ORS 536.075 and OAR 137.004-0080 and OAR 690-01-0005 you may either petition for

ention the Director for reconsideration of this order.

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CI	as required by ORS 537.765 &	OAR 698-240-0951	Start Card # 1(047)2						
	Instructions for completing th	a report are on the last mage of this form.							
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C	in Par Hounes	State OR . Zin 97210	1. NW 14 M NW 1/4 of above section.						
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#### Kerry Gallagher

From:

BAYUK Dana <BAYUK.Dana@deg.state.or.us>

Sent: To:

Tuesday, January 28, 2014 9:19 AM

James Peale

Cc:

Burr, Myron; Gladstone, Alan; Church, Brian (BCHURCH@davisrothwell.com); Chris Reive (Chris.Reive@jordanramis.com); Earle, William G. (WEARLE@davisrothwell.com);

Kerry Gallagher; BYRD Kristopher R; LARSEN Henning

Subject:

RE: Siltronic - Conversation Confirmation

#### Good morning James.

This e-mail confirms that during our telephone conversation yesterday I informed you that Siltronic Corporation should prepare a plan for abandoning monitoring well WS-14-161. The screen and sand pack interval of this monitoring well penetrates through the "deep aquitard" identified beneath the Siltronic property. The appearance of dense-non aqueous phase liquid (DNAPL) in the monitoring well indicates the installation is acting as a pathway for contamination to migrate vertically downward through the deep aquitard into deeper intervals of the Alluvium water-bearing zone.

As I indicated during yesterday's call, based on the information summarized above DEQ has determined that abandonment of WS-14-161 is required under the TCE Order (DEQ No. VC-NWR-03-16). Abandonment of WS-14-161 should be conducted consistent with OAR-690-240 and previously approved protocols for abandoning monitoring wells at the Gasco and Siltronic sites (e.g., use of organoclay-bentonite sealant).

Previous work at the adjoining Gasco Site identified potential causes for DNAPL to appear in monitoring wells including: 1)migration of DNAPL to the monitoring well location; and/or 2) vertical migration of DNAPL down the borehole due to failure of the monitoring well seal. Siltronic should assess the cause of DNAPL appearance in WS-14-161 by videolng the inside of the 2-inch monitoring well casing and screen prior to abandonment and, to the extent practicable documenting visual evidence of the depth of DNAPL occurrence during abandonment.

As indicated in your e-mail, Siltronic should submit the abandonment plan for WS-14-161 on or before February 14, 2014.

Please don't hesitate to contact me with questions regarding this e-mail.

Mr. Dana Bayuk, Project Manager NW Region Cleanup & Site Assessment Section Oregon Department of Environmental Quality 2020 SW 4th Avenue, Suite 400 Portland, OR 97201 E-mail: bayuk.dana@deg.state.or.us

Phone: 503-229-5543

FAX: 503-229-6899

Please visit our website at http://www.oregon.gov/DEQ/



please consider the environment before printing this email

From: James Peale [mailto:ipeale@maulfoster.com]

**Sent:** Monday, January 27, 2014 4:50 PM

To: BAYUK Dana

Cc: Burr, Myron; Gladstone, Alan; Church, Brian (BCHURCH@davisrothwell.com); Chris Reive (Chris.Reive@jordanramis.com); Earle, William G. (WEARLE@davisrothwell.com); Kerry Gallagher

Subject: Siltronic - Conversation Confirmation

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JAN 23 2015

#### Dana -

This email is provided as a continuation to our conversation of this morning. For the purposes of documentation, Siltronic requires DEQ's email confirmation that DEQ has directed Siltronic to submit a workplan for the abandonment of nested wells WS-14-125 and WS-14-161. The workplan is due February 14, 2014. Please also confirm that the workplan should describe abandonment consistent with WRD regulations (e.g., OAR 690-220 Abandonment of Wells).

MFA is prepared to submit the workplan consistent with these requirements. Please note that if the workplan is approved, Siltronic will require written direction from DEQ in order to proceed with the abandonment.

Thanks in advance, Dana.

jp

JAMES G.D. PEALE RG, LHG | MAUL FOSTER ALONGI

d. 503 501 5218 | p. 971 544 2139 | c. 503 449 9576 | f. 971 544 2140 | www.maulfoster.com

2001 NW 19th Avenue, Suite 200, Portland, OR 97209

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JAN 2 3 2015

WATER RESGURCES DEPT SALEM, OREGON From:

BAYUK Dana Kerry Gallagher

To: Cc:

James Peale; Burr, Myron (Myron, Burr@siltronic.com); Gladstone, Alan (AGLADSTONE@davisrothwell.com); Church, Brian (BCHURCH@davisrothwell.com); Earle, William G. (WEARLE@davisrothwell.com); Chris Rejve (Chris.Reive@iordanramis.com); JOHNSON Keith; koch.kristine@epa.gov; Sheldrake.Sean@epamail.epa.gov; Fuentes, Rene@epamail.epa.gov; Peterson, Lance (PetersonLE@cdmsmith.com); pdost@pearllegalgroup.com; John Edwards (jedwards@anchorgea.com); Carl Stivers (cstivers@anchorgea.com); riw@nwnatural.com; Rob

Ede (robe@hahnenv.com); BYRD Kristopher R; GAINER Torn; LARSEN Henning; MCCLINCY Matt

Subject:

RE: Siltronic: Monitoring Well WS-14 Abandonment WP

Date:

Thursday, April 10, 2014 5:42:12 PM

#### Good afternoon Kerry.

DEQ reviewed the "Monitoring Well WS-14 Abandonment Plan, Siltronic Corporation, 7200 NW Front Avenue, Portland, OR - ECSI No. 183" dated February 14, 2014 (Abandonment Plan). As we discussed by telephone the Abandonment Plan provides insufficient information regarding decommissioning procedures, particularly with respect to over-drilling and removing monitoring well construction materials.

As requested by DEQ, the Abandonment Plan includes a task to video log the WS-14-125/161 monitoring wells before they are decommissioned. During telephone discussions we concluded the video log could provide useful information for developing the approach to decommissioning the two installations. Based on this conclusion, DEQ verbally approved Siltronic moving forward with video logging. This e-mail provides DEQ's written approval for Siltronic to proceed with the video logs of WS-14-125/161.

DEQ understands video logging will be conducted on April 11, 2014. DEQ requests that three copies of the log be provided on disc for our information and use. This e-mail also acknowledges that you notified me of the work and schedule during our phone discussion on April 3<sup>rd</sup>.

Please feel free to contact me with questions regarding this e-mail.

#### Dana

Mr. Dana Bayuk, Project Manager NW Region Cleanup & Site Assessment Section Oregon Department of Environmental Quality 2020 SW 4th Avenue, Suite 400 Portland, OR 97201

E-mail: bayuk.dana@deg.state.or.us

Phone: 503-229-5543 FAX: 503-229-6899

Please visit our website at http://www.oregon.gov/DEQ/



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JAN 2 3 2015

From: Kerry Gallagher [mailto:kgallagher@maulfoster.com]

WATER RESOURCES DEPT SALEM, OREGON

Sent: Friday, February 14, 2014 3:58 PM

To: BAYUK Dana

Cc: James Peale; Burr, Myron (Myron.Burr@slitronic.com); Gladstone, Alan (AGLADSTONE@davisrothwell.com); Church, Brian (BCHURCH@davisrothwell.com); Earle, William G. (WEARLE@davisrothwell.com); Chris Reive (Chris.Reive@jordanramis.com); JOHNSON Keith; koch.kristine@epa.gov; Sheldrake.Sean@epamail.epa.gov; Fuentes.Rene@epamail.epa.gov; Peterson, Lance (PetersonLE@cdmsmith.com); pdost@pearllegalgroup.com; John Edwards (jedwards@anchorqea.com); Carl Stivers (cstivers@anchorqea.com); rjw@nwnatural.com; Rob Ede (robe@hahnenv.com); GAINER Tom; LARSEN Henning; MCCLINCY Matt
Subject: Siltronic: Monitoring Well WS-14 Abandonment WP

Dana,

As requested, please find the attached Monitoring Well WS-14 Abandonment Work Plan for your review and approval. The required hard copies of this submittal will follow by mail.

Please call or email if you have any questions. Thank you,

#### KERRY-CATHLIN GALLAGHER | MAUL FOSTER & ALONGI, INC.

direct. 503 501 5229 | main office. 971 544 2139 | cell. 503 896 0255 | fax. 971 544 2140 | <u>www.maulfoster.com</u> 2001 NW 19th Avenue, Suite 200, Portland, Oregon 97209

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JAN 23 2015

### **Kerry Gallagher**

From: BAYUK Dana <BAYUK.Dana@deq.state.or.us>

Sent: Wednesday, June 25, 2014 4:38 PM

To: 'Burr, Myron (Myron.Burr@siltronic.com)'

Cc: 'Gladstone, Alan (AGLADSTONE@davisrothwell.com)'; James Peale; Kerry Gallagher;

Bob Wyatt; Patty Dost; 'John Edwards (jedwards@anchorgea.com)'; 'Ben Hung'; John

Renda; Rob Ede; 'Sheldrake, Sean'; Mullin, Jeanette; 'Peterson, Lance

(PetersonLE@cdmsmith.com)'; Coffey, Scott; BYRD Kristopher R; JOHNSON Keith;

GAINER Tom; LARSEN Henning; MCCLINCY Matt

Subject: RE: Siltronic: Monitoring Well WS-14 Abandonment WP

#### Good afternoon Myron.

Consistent with DEQ's April 10, 2014 e-mail (see below), Siltronic Corporation (Siltronic) completed video logging of monitoring wells WS-14-125 and WS-14-161 on April 14, 2014. DEQ reviewed the video logs and concludes that dense non-aqueous phase liquids (DNAPLs) are entering the monitoring well screens and sand-packed intervals of both installations. These two monitoring wells are constructed in a single borehole and together are designated "WS-14-125/161."

In addition, as indicated in our May 20, 2014 letter commenting on the Phase 1-Step 4 Report (see footnote), DEQ concludes the screen and sand-packed intervals of monitoring wells WS-11-161 and WS-14-161 penetrate the deep aquitard and hydraulically connect the upper lower Alluvium water-bearing zone (WBZ) and the deep lower Alluvium WBZ.

Monitoring well WS-11-161 is collocated with WS-11-125 in a single borehole and the two wells together are designated "WS-11-125/161." Groundwater contamination is documented in both of these monitoring wells.

Based on the information summarized above, DEQ further concludes that:

- Monitoring wells WS-14-125 and WS-14-161 represent potential pathways for DNAPLs to migrate vertically downward into deeper intervals of the upper lower Alluvium WBZ and deep lower Alluvium WBZ; and
- Monitoring well WS-11-161 represents a potential pathway for groundwater contamination in the upper lower Alluvium WBZ to migrate vertically downward into the deep lower Alluvium WBZ.

DEQ requires that WS-11-125/161 and WS-14-125/161 be permanently abandoned through over drilling and removal consistent with OAR 690-290-0510. Siltronic should prepare and submit a work plan for this purpose for DEQ's review within 30-days of receiving this e-mail.

DEQ acknowledges and appreciates the video logs of WS-14-125/161. The logs were very useful for determining the status of the installations. Please don't hesitate to contact me with questions regarding this e-mail.

#### Dana

Mr. Dana Bayuk, Project Manager NW Region Cleanup & Site Assessment Section Oregon Department of Environmental Quality 2020 SW 4th Avenue, Suite 400 Portland, OR 97201

E-mail: bayuk.dana@deq.state.or.us Phone: 503-229-5543

FAX. 503-229-6899

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JAN 23 2015



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Footnote. Anchor QEA, LLC, 2014, "Data Report: Groundwater Source Control Extraction System Test - Phase 1 Step 4 - NW Natural Gasco Site," April 10, a report prepared for NW Natural.

From: BAYUK Dana

Sent: Thursday, April 10, 2014 5:41 PM

To: 'Kerry Gallagher'

Cc: James Peale; Burr, Myron (Myron.Burr@siltronic.com); Gladstone, Alan (AGLADSTONE@davisrothwell.com); Church,

Brian (BCHURCH@davisrothwell.com); Earle, William G. (WEARLE@davisrothwell.com); Chris Reive

(Chris.Reive@jordanramis.com); JOHNSON Keith; koch.kristine@epa.gov; Sheldrake.Sean@epamail.epa.gov; Fuentes Rene@epamail.epa.gov; Peterson, Lance (PetersonLE@cdmsmith.com); pdost@pearllegalgroup.com; John Edwards (jedwards@anchorqea.com); Carl Stivers (cstivers@anchorqea.com); rjw@nwnatural.com; Rob Ede

(robe@hahnenv.com); BYRD Kristopher R; GAINER Tom; LARSEN Henning; MCCLINCY Matt

Subject: RE: Siltronic: Monitoring Well WS-14 Abandonment WP

Good afternoon Kerry.

DEQ reviewed the "Monitoring Well WS-14 Abandonment Plan, Siltronic Corporation, 7200 NW Front Avenue, Portland, OR - ECSI No. 183" dated February 14, 2014 (Abandonment Plan). As we discussed by telephone the Abandonment Plan provides insufficient information regarding decommissioning procedures, particularly with respect to over-drilling and removing monitoring well construction materials.

As requested by DEQ, the Abandonment Plan includes a task to video log the WS-14-125/161 monitoring wells before they are decommissioned. During telephone discussions we concluded the video log could provide useful information for developing the approach to decommissioning the two installations. Based on this conclusion, DEQ verbally approved Siltronic moving forward with video logging. This e-mail provides DEQ's written approval for Siltronic to proceed with the video logs of WS-14-125/161.

DEQ understands video logging will be conducted on April 11, 2014. DEQ requests that three copies of the log be provided on disc for our information and use. This e-mail also acknowledges that you notified me of the work and schedule during our phone discussion on April 3rd.

Please feel free to contact me with questions regarding this e-mail.

#### Dana

Mr. Dana Bayuk, Project Manager NW Region Cleanup & Site Assessment Section Oregon Department of Environmental Quality 2020 SW 4th Avenue, Suite 400 Portland, OR 97201 E-mail: bayuk.dana@deq.state.or.us

Phone: 503-229-5543

FAX: 503-229-6899

Please visit our website at http://www.oregon.gov/DEQ/



please consider the environment before printing this email

From: Kerry Gallagher [mailto:kgallagher@maulfoster.com]

Sent: Friday, February 14, 2014 3:58 PM

To: BAYUK Dana

JAN 2 0 2015 Cc: James Peale; Burr, Myron (Myron.Burr@siltronic.com); Gladstone, Alan (AGLADSTONE@davisrothwell.com); Church,

> WATER RESOURCES DEPT SALEM, OREGON

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Brian (<u>BCHURCH@davisrothwell.com</u>); Earle, William G. (<u>WEARLE@davisrothwell.com</u>); Chris Reive (<u>Chris.Reive@jordanramis.com</u>); JOHNSON Keith; <u>koch.kristine@epa.gov</u>; <u>Sheldrake.Sean@epamail.epa.gov</u>; <u>Fuentes.Rene@epamail.epa.gov</u>; Peterson, Lance (<u>PetersonLE@cdmsmith.com</u>); <u>pdost@pearllegalgroup.com</u>; John Edwards (<u>Jedwards@anchorgea.com</u>); Carl Stivers (<u>cstivers@anchorgea.com</u>); <u>rjw@nwnatural.com</u>; Rob Ede (<u>robe@hahnenv.com</u>); <u>GAINER Tom</u>; LARSEN Henning; MCCLINCY Matt **Subject:** Siltronic: Monitoring Well WS-14 Abandonment WP

Dana,

As requested, please find the attached Monitoring Well WS-14 Abandonment Work Plan for your review and approval. The required hard copies of this submittal will follow by mail.

Please call or email if you have any questions. Thank you,

KERRY-CATHLIN GALLAGHER | MAUL FOSTER & ALONGI, INC.

direct. 503 501 5229 | main office. 971 544 2139 | cell. 503 896 0255 | fax. 971 544 2140 | www.maulfoster.com 2001 NW 19th Avenue, Suite 200, Portland, Oregon 97209

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JAN 23 2015

WATER RESOURCES DEPT SALEM, OREGON

# ATTACHMENT C

LABORATORY ANALYTICAL REPORTS





11711 SE Capps Road, Ste B Clackamas, Oregon 97015 TEL: 503-607-1331 FAX: 503-607-1336 Website: www.specialtyanalytical.com

February 25, 2015

James Peale Maul Foster & Alongi 400 E. Mill Plain Blvd. Suite 400 Vancouver, WA 98660

TEL: (360) 694-2691

FAX (360) 906-1958

RE: Siltronic IDW / 8128.01.08/08

Dear James Peale: Order No.: 1502126

Specialty Analytical received 2 sample(s) on 2/11/2015 for the analyses presented in the following report.

There were no problems with the analysis and all data for associated QC met EPA or laboratory specifications, except where noted in the Case Narrative, or as qualified with flags. Results apply only to the samples analyzed. Without approval of the laboratory, the reproduction of this report is only permitted in its entirety.

If you have any questions regarding these tests, please feel free to call.

Sincerely,

Marty French

Lab Director

CLIENT: Maul Foster & Alongi Collection Date: 2/11/2015 11:15:00 AM

**Date Reported:** 

25-Feb-15

**Project:** Siltronic IDW / 8128.01.08/08

**Lab ID:** 1502126-001

Client Sample ID: DRUMS-SO-10-36 Matrix: SOIL

Analyses	Result	RL	Qual	Unit	DF	Date Analyzed
NWTPH-DX		NWTPH-DX				Analyst: BS
Diesel	71.6	20.9	A1	mg/Kg-dry	1	2/17/2015 9:38:09 AM
Lube Oil	ND	69.8		mg/Kg-dry	1	2/17/2015 9:38:09 AM
Surr: o-Terphenyl	52.5	50-150		%REC	1	2/17/2015 9:38:09 AM
NWTPH-GX		NWTPH-GX				Analyst: BS
Gasoline	21.3	3.49		mg/Kg-dry	1	2/19/2015 11:29:03 AM
Surr: 4-Bromofluorobenzene	61.0	50-150		%REC	1	2/19/2015 11:29:03 AM
TCLP 8 ICP/MS METALS-TCLP LEA	CHED	E1311/6020				Analyst: <b>KP</b>
Arsenic, TCLP	ND	6.98		μg/L	1	2/19/2015 5:12:00 PM
Barium, TCLP	457	69.8		μg/L	1	2/19/2015 5:12:00 PM
Cadmium, TCLP	ND	6.98		μg/L	1	2/19/2015 5:12:00 PM
Chromium, TCLP	ND	6.98		μg/L	1	2/19/2015 5:12:00 PM
Lead, TCLP	ND	6.98		μg/L	1	2/19/2015 5:12:00 PM
Selenium, TCLP	ND	69.8		μg/L	1	2/19/2015 5:12:00 PM
Silver, TCLP	ND	6.98		μg/L	1	2/19/2015 5:12:00 PM
TCLP 8 TOTAL MERCURY		E7470A				Analyst: <b>BW</b>
Mercury, TCLP	ND	0.000100		mg/L	1	2/17/2015 3:00:09 PM
SEMIVOLATILE ORGANICS-LOW L	EVEL	SW8270D				Analyst: <b>bda</b>
1,2,4-Trichlorobenzene	ND	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
1,2-Dichlorobenzene	ND	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
1,2-Diphenylhydrazine	ND	167		μg/Kg	1	2/18/2015 12:04:00 PM
1,3-Dichlorobenzene	ND	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
1,4-Dichlorobenzene	ND	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
1-Methylnaphthalene	452	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
2,4,5-Trichlorophenol	ND	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
2,4,6-Trichlorophenol	ND	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
2,4-Dichlorophenol	ND	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
2,4-Dimethylphenol	ND	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
2,4-Dinitrophenol	ND	333		μg/Kg	1	2/18/2015 12:04:00 PM
2,4-Dinitrotoluene	ND	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
2,6-Dinitrotoluene	ND	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
2-Chloronaphthalene	ND	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
2-Chlorophenol	ND	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
2-Methylnaphthalene	623	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
2-Methylphenol	ND	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
2-Nitroaniline	ND	33.3		μg/Kg	1	2/18/2015 12:04:00 PM

CLIENT: Maul Foster & Alongi Collection Date: 2/11/2015 11:15:00 AM

**Date Reported:** 

25-Feb-15

**Project:** Siltronic IDW / 8128.01.08/08

**Lab ID:** 1502126-001

Client Sample ID: DRUMS-SO-10-36 Matrix: SOIL

analyses	Result	RL	Qual	Unit	DF	Date Analyzed
SEMIVOLATILE ORGANICS-LO	W LEVEL	SW8270D				Analyst: <b>bda</b>
2-Nitrophenol	ND	167		μg/Kg	1	2/18/2015 12:04:00 PM
3-&4-Methylphenol	ND	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
3,3-Dichlorobenzidine	ND	167		μg/Kg	1	2/18/2015 12:04:00 PM
3-Nitroaniline	ND	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
4,6-Dinitro-2-methylphenol	ND	167		μg/Kg	1	2/18/2015 12:04:00 PM
4-Bromophenyl phenyl ether	ND	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
4-Chloro-3-methylphenol	ND	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
4-Chloroaniline	ND	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
4-Chlorophenyl phenyl ether	ND	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
4-Nitroaniline	ND	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
4-Nitrophenol	ND	167		μg/Kg	1	2/18/2015 12:04:00 PM
Acenaphthene	1600	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
Acenaphthylene	88.3	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
Aniline	ND	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
Anthracene	658	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
Benz(a)anthracene	686	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
Benzidine	ND	167		μg/Kg	1	2/18/2015 12:04:00 PM
Benzo(a)pyrene	888	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
Benzo(b)fluoranthene	796	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
Benzo(g,h,i)perylene	870	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
Benzo(k)fluoranthene	300	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
Benzoic Acid	ND	667		μg/Kg	1	2/18/2015 12:04:00 PM
Benzyl Alcohol	ND	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
Benzyl butyl phthalate	ND	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
Bis(2-chloroethoxy)methane	ND	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
Bis(2-chloroethyl)ether	ND	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
Bis(2-chloroisopropyl)ether	ND	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
Bis(2-ethylhexyl)phthalate	ND	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
Carbazole	113	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
Chrysene	697	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
Dibenz(a,h)anthracene	160	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
Dibenzofuran	72.3	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
Diethyl phthalate	ND	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
Dimethyl phthalate	ND	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
Di-n-butyl phthalate	ND	50.0		μg/Kg	1	2/18/2015 12:04:00 PM
Di-n-octyl phthalate	ND	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
Fluoranthene	1680	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
Fluorene	569	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
Hexachlorobenzene	ND	33.3		μg/Kg	1	2/18/2015 12:04:00 PM

CLIENT: Maul Foster & Alongi Collection Date: 2/11/2015 11:15:00 AM

**Date Reported:** 

25-Feb-15

**Project:** Siltronic IDW / 8128.01.08/08

**Lab ID:** 1502126-001

Client Sample ID: DRUMS-SO-10-36 Matrix: SOIL

analyses	Result	RL	Qual	Unit	DF	Date Analyzed
SEMIVOLATILE ORGANICS-LOW LE	VEL	SW8270D				Analyst: <b>bda</b>
Hexachlorobutadiene	ND	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
Hexachlorocyclopentadiene	ND	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
Hexachloroethane	ND	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
Indeno(1,2,3-cd)pyrene	630	33.3		μg/Kg	1	2/18/2015 12:04:00 PN
Isophorone	ND	33.3		μg/Kg	1	2/18/2015 12:04:00 PN
Naphthalene	1030	33.3		μg/Kg	1	2/18/2015 12:04:00 PN
Nitrobenzene	ND	33.3		μg/Kg	1	2/18/2015 12:04:00 PN
N-Nitrosodimethylamine	ND	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
N-Nitrosodi-n-propylamine	ND	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
N-Nitrosodiphenylamine	ND	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
Pentachlorophenol	ND	50.0		μg/Kg	1	2/18/2015 12:04:00 PM
Phenanthrene	3130	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
Phenol	ND	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
Pyrene	3000	33.3		μg/Kg	1	2/18/2015 12:04:00 PM
Pyridine	ND	167		μg/Kg	1	2/18/2015 12:04:00 PM
Surr: 2,4,6-Tribromophenol	54.4	57.8-119	S	%REC	1	2/18/2015 12:04:00 PM
Surr: 2-Fluorobiphenyl	66.2	52.6-93.2		%REC	1	2/18/2015 12:04:00 PM
Surr: 2-Fluorophenol	123	40.7-111	S	%REC	1	2/18/2015 12:04:00 PM
Surr: 4-Terphenyl-d14	136	49.8-118	S	%REC	1	2/18/2015 12:04:00 PM
Surr: Nitrobenzene-d5	100	44.8-103		%REC	1	2/18/2015 12:04:00 PM
Surr: Phenol-d6	115	47.5-117		%REC	1	2/18/2015 12:04:00 PM
VOLATILE ORGANICS BY GC/MS		SW8260B				Analyst: <b>CK</b>
1,1,1,2-Tetrachloroethane	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
1,1,1-Trichloroethane	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
1,1,2,2-Tetrachloroethane	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
1,1,2-Trichloroethane	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
1,1-Dichloroethane	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
1,1-Dichloroethene	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
1,1-Dichloropropene	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
1,2,3-Trichlorobenzene	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
1,2,3-Trichloropropane	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
1,2,4-Trichlorobenzene	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
1,2,4-Trimethylbenzene	14.2	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
1,2-Dibromo-3-chloropropane	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
1,2-Dibromoethane	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
1,2-Dichlorobenzene	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
1,2-Dichloroethane	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM

CLIENT: Maul Foster & Alongi Collection Date: 2/11/2015 11:15:00 AM

**Date Reported:** 

25-Feb-15

**Project:** Siltronic IDW / 8128.01.08/08

**Lab ID:** 1502126-001

Analyses	Result	RL	Qual	Unit	DF	Date Analyzed
VOLATILE ORGANICS BY GC/MS	:	SW8260B				Analyst: <b>CK</b>
1,2-Dichloropropane	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
1,3,5-Trimethylbenzene	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
1,3-Dichlorobenzene	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
1,3-Dichloropropane	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
1,4-Dichlorobenzene	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
2,2-Dichloropropane	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
2-Butanone	ND	20.0		μg/Kg	1	2/16/2015 4:55:00 PM
2-Chlorotoluene	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
2-Hexanone	ND	20.0		μg/Kg	1	2/16/2015 4:55:00 PM
4-Chlorotoluene	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
4-Isopropyltoluene	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
4-Methyl-2-pentanone	ND	20.0		μg/Kg	1	2/16/2015 4:55:00 PM
Acetone	ND	50.0		μg/Kg	1	2/16/2015 4:55:00 PM
Benzene	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
Bromobenzene	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
Bromochloromethane	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
Bromodichloromethane	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
Bromoform	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
Bromomethane	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
Carbon disulfide	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
Carbon tetrachloride	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
Chlorobenzene	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
Chloroethane	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
Chloroform	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
Chloromethane	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
cis-1,2-Dichloroethene	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
cis-1,3-Dichloropropene	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
Dibromochloromethane	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
Dibromomethane	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
Dichlorodifluoromethane	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
Ethylbenzene	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
Hexachlorobutadiene	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
Isopropylbenzene	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
m,p-Xylene	ND	20.0		μg/Kg	1	2/16/2015 4:55:00 PM
Methyl tert-butyl ether	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
Methylene chloride	ND	50.0		μg/Kg	1	2/16/2015 4:55:00 PM
Naphthalene	171	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
n-Butylbenzene	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
n-Propylbenzene	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM

CLIENT: Maul Foster & Alongi Collection Date: 2/11/2015 11:15:00 AM

**Date Reported:** 

25-Feb-15

**Project:** Siltronic IDW / 8128.01.08/08

**Lab ID:** 1502126-001

Analyses	Result	RL	Qual	Unit	DF	Date Analyzed
VOLATILE ORGANICS BY GC/MS		SW8260B				Analyst: <b>CK</b>
o-Xylene	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
sec-Butylbenzene	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
Styrene	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
tert-Butylbenzene	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
Tetrachloroethene	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
Toluene	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
trans-1,2-Dichloroethene	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
trans-1,3-Dichloropropene	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
Trichloroethene	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
Trichlorofluoromethane	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
Vinyl chloride	ND	10.0		μg/Kg	1	2/16/2015 4:55:00 PM
Surr: 1,2-Dichloroethane-d4	87.2	71.5-112		%REC	1	2/16/2015 4:55:00 PM
Surr: 4-Bromofluorobenzene	97.3	75.7-122		%REC	1	2/16/2015 4:55:00 PM
Surr: Dibromofluoromethane	96.8	64.3-124		%REC	1	2/16/2015 4:55:00 PM
Surr: Toluene-d8	103	74.9-120		%REC	1	2/16/2015 4:55:00 PM
PCB'S IN SOLIDS		SW 8082A				Analyst: BS
Aroclor 1016	ND	0.333		μg/Kg	1	2/20/2015 10:56:00 PM
Aroclor 1221	ND	0.333		μg/Kg	1	2/20/2015 10:56:00 PM
Aroclor 1232	ND	0.333		μg/Kg	1	2/20/2015 10:56:00 PM
Aroclor 1242	ND	0.333		μg/Kg	1	2/20/2015 10:56:00 PM
Aroclor 1248	ND	0.333		μg/Kg	1	2/20/2015 10:56:00 PM
Aroclor 1254	117	0.333		μg/Kg	1	2/23/2015 11:15:00 AM
Aroclor 1260	ND	0.333		μg/Kg	1	2/20/2015 10:56:00 PM
Aroclor 1262	ND	0.333		μg/Kg	1	2/20/2015 10:56:00 PM
Aroclor 1268	ND	0.333		μg/Kg	1	2/20/2015 10:56:00 PM
Surr: Decachlorobiphenyl	169	56.5-130	S	%REC	1	2/20/2015 10:56:00 PM
CYANIDE		SW9012B				Analyst: <b>EFH</b>
Cyanide, Total	1.01	0.100		mg/Kg	5	2/18/2015 11:24:45 AM

CLIENT: Maul Foster & Alongi Collection Date: 2/11/2015 12:00:00 PM

**Date Reported:** 

25-Feb-15

**Project:** Siltronic IDW / 8128.01.08/08

**Lab ID:** 1502126-002

Analyses	Result	RL	Qual	Unit	DF	Date Analyzed
NWTPH-DX		NWTPH-DX				Analyst: BS
Diesel	ND	18.8		mg/Kg-dry	1	2/17/2015 10:00:09 AM
Lube Oil	ND	62.7		mg/Kg-dry	1	2/17/2015 10:00:09 AM
Surr: o-Terphenyl	50.3	50-150		%REC	1	2/17/2015 10:00:09 AM
NWTPH-GX		NWTPH-GX				Analyst: BS
Gasoline	ND	3.14		mg/Kg-dry	1	2/19/2015 12:29:03 PM
Surr: 4-Bromofluorobenzene	64.6	50-150		%REC	1	2/19/2015 12:29:03 PM
TCLP 8 ICP/MS METALS-TCLP LEA	CHED	E1311/6020				Analyst: <b>KP</b>
Arsenic, TCLP	ND	6.27		μg/L	1	2/19/2015 5:19:00 PM
Barium, TCLP	677	62.7		μg/L	1	2/19/2015 5:19:00 PM
Cadmium, TCLP	ND	6.27		μg/L	1	2/19/2015 5:19:00 PM
Chromium, TCLP	ND	6.27		μg/L	1	2/19/2015 5:19:00 PM
Lead, TCLP	14.1	6.27		μg/L	1	2/19/2015 5:19:00 PM
Selenium, TCLP	ND	62.7		μg/L	1	2/19/2015 5:19:00 PM
Silver, TCLP	ND	6.27		μg/L	1	2/19/2015 5:19:00 PM
TCLP 8 TOTAL MERCURY		E7470A				Analyst: <b>BW</b>
Mercury, TCLP	ND	0.000100		mg/L	1	2/17/2015 3:02:09 PM
SEMIVOLATILE ORGANICS-LOW I	.EVEL	SW8270D				Analyst: <b>bda</b>
1,2,4-Trichlorobenzene	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
1,2-Dichlorobenzene	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
1,2-Diphenylhydrazine	ND	167		μg/Kg	1	2/18/2015 11:35:00 AM
1,3-Dichlorobenzene	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
1,4-Dichlorobenzene	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
1-Methylnaphthalene	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
2,4,5-Trichlorophenol	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
2,4,6-Trichlorophenol	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
2,4-Dichlorophenol	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
2,4-Dimethylphenol	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
2,4-Dinitrophenol	ND	333		μg/Kg	1	2/18/2015 11:35:00 AM
2,4-Dinitrotoluene	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
2,6-Dinitrotoluene	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
2-Chloronaphthalene	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
2-Chlorophenol	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
2-Methylnaphthalene	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
2-Methylphenol	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
2-Nitroaniline	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM

CLIENT: Maul Foster & Alongi Collection Date: 2/11/2015 12:00:00 PM

**Date Reported:** 

25-Feb-15

**Project:** Siltronic IDW / 8128.01.08/08

**Lab ID:** 1502126-002

analyses	Result	RL	Qual	Unit	DF	Date Analyzed
SEMIVOLATILE ORGANICS-LO	W LEVEL	SW8270D				Analyst: <b>bda</b>
2-Nitrophenol	ND	167		μg/Kg	1	2/18/2015 11:35:00 AM
3-&4-Methylphenol	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
3,3-Dichlorobenzidine	ND	167		μg/Kg	1	2/18/2015 11:35:00 AM
3-Nitroaniline	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
4,6-Dinitro-2-methylphenol	ND	167		μg/Kg	1	2/18/2015 11:35:00 AM
4-Bromophenyl phenyl ether	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
4-Chloro-3-methylphenol	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
4-Chloroaniline	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
4-Chlorophenyl phenyl ether	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
4-Nitroaniline	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
4-Nitrophenol	ND	167		μg/Kg	1	2/18/2015 11:35:00 AM
Acenaphthene	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
Acenaphthylene	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
Aniline	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
Anthracene	46.0	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
Benz(a)anthracene	52.7	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
Benzidine	ND	167		μg/Kg	1	2/18/2015 11:35:00 AM
Benzo(a)pyrene	125	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
Benzo(b)fluoranthene	105	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
Benzo(g,h,i)perylene	149	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
Benzo(k)fluoranthene	33.7	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
Benzoic Acid	ND	667		μg/Kg	1	2/18/2015 11:35:00 AM
Benzyl Alcohol	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
Benzyl butyl phthalate	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
Bis(2-chloroethoxy)methane	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
Bis(2-chloroethyl)ether	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
Bis(2-chloroisopropyl)ether	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
Bis(2-ethylhexyl)phthalate	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
Carbazole	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
Chrysene	53.3	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
Dibenz(a,h)anthracene	42.7	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
Dibenzofuran	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
Diethyl phthalate	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
Dimethyl phthalate	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
Di-n-butyl phthalate	ND	50.0		μg/Kg	1	2/18/2015 11:35:00 AM
Di-n-octyl phthalate	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
Fluoranthene	137	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
Fluorene	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
Hexachlorobenzene	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM

CLIENT: Maul Foster & Alongi Collection Date: 2/11/2015 12:00:00 PM

**Date Reported:** 

25-Feb-15

**Project:** Siltronic IDW / 8128.01.08/08

**Lab ID:** 1502126-002

Analyses	Result	RL	Qual	Unit	DF	Date Analyzed
SEMIVOLATILE ORGANICS-LOW LE	VEL	SW8270D				Analyst: <b>bda</b>
Hexachlorobutadiene	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
Hexachlorocyclopentadiene	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
Hexachloroethane	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
Indeno(1,2,3-cd)pyrene	110	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
Isophorone	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
Naphthalene	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
Nitrobenzene	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
N-Nitrosodimethylamine	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
N-Nitrosodi-n-propylamine	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
N-Nitrosodiphenylamine	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
Pentachlorophenol	ND	50.0		μg/Kg	1	2/18/2015 11:35:00 AM
Phenanthrene	209	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
Phenol	ND	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
Pyrene	158	33.3		μg/Kg	1	2/18/2015 11:35:00 AM
Pyridine	ND	167		μg/Kg	1	2/18/2015 11:35:00 AM
Surr: 2,4,6-Tribromophenol	48.8	57.8-119	S	%REC	1	2/18/2015 11:35:00 AM
Surr: 2-Fluorobiphenyl	103	52.6-93.2	S	%REC	1	2/18/2015 11:35:00 AM
Surr: 2-Fluorophenol	112	40.7-111	S	%REC	1	2/18/2015 11:35:00 AM
Surr: 4-Terphenyl-d14	109	49.8-118		%REC	1	2/18/2015 11:35:00 AM
Surr: Nitrobenzene-d5	114	44.8-103	S	%REC	1	2/18/2015 11:35:00 AM
Surr: Phenol-d6	101	47.5-117		%REC	1	2/18/2015 11:35:00 AM
VOLATILE ORGANICS BY GC/MS		SW8260B				Analyst: <b>CK</b>
1,1,1,2-Tetrachloroethane	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
1,1,1-Trichloroethane	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
1,1,2,2-Tetrachloroethane	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
1,1,2-Trichloroethane	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
1,1-Dichloroethane	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
1,1-Dichloroethene	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
1,1-Dichloropropene	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
1,2,3-Trichlorobenzene	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
1,2,3-Trichloropropane	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
1,2,4-Trichlorobenzene	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
1,2,4-Trimethylbenzene	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
1,2-Dibromo-3-chloropropane	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
1,2-Dibromoethane	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
1,2-Dichlorobenzene	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
1,2-Dichloroethane	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM

CLIENT: Maul Foster & Alongi Collection Date: 2/11/2015 12:00:00 PM

**Date Reported:** 

25-Feb-15

**Project:** Siltronic IDW / 8128.01.08/08

**Lab ID:** 1502126-002

Analyses	Result	RL	Qual	Unit	DF	Date Analyzed
VOLATILE ORGANICS BY GC/MS	;	SW8260B				Analyst: <b>CK</b>
1,2-Dichloropropane	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
1,3,5-Trimethylbenzene	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
1,3-Dichlorobenzene	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
1,3-Dichloropropane	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
1,4-Dichlorobenzene	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
2,2-Dichloropropane	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
2-Butanone	ND	20.0		μg/Kg	1	2/17/2015 11:29:00 AM
2-Chlorotoluene	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
2-Hexanone	ND	20.0		μg/Kg	1	2/17/2015 11:29:00 AM
4-Chlorotoluene	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
4-Isopropyltoluene	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
4-Methyl-2-pentanone	ND	20.0		μg/Kg	1	2/17/2015 11:29:00 AM
Acetone	ND	50.0		μg/Kg	1	2/17/2015 11:29:00 AM
Benzene	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
Bromobenzene	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
Bromochloromethane	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
Bromodichloromethane	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
Bromoform	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
Bromomethane	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
Carbon disulfide	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
Carbon tetrachloride	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
Chlorobenzene	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
Chloroethane	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
Chloroform	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
Chloromethane	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
cis-1,2-Dichloroethene	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
cis-1,3-Dichloropropene	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
Dibromochloromethane	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
Dibromomethane	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
Dichlorodifluoromethane	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
Ethylbenzene	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
Hexachlorobutadiene	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
Isopropylbenzene	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
m,p-Xylene	ND	20.0		μg/Kg	1	2/17/2015 11:29:00 AM
Methyl tert-butyl ether	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
Methylene chloride	63.1	50.0		μg/Kg	1	2/17/2015 11:29:00 AM
Naphthalene	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
n-Butylbenzene	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
n-Propylbenzene	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM

CLIENT: Maul Foster & Alongi Collection Date: 2/11/2015 12:00:00 PM

**Date Reported:** 

25-Feb-15

**Project:** Siltronic IDW / 8128.01.08/08

**Lab ID:** 1502126-002

Analyses	Result	RL	Qual	Unit	DF	Date Analyzed
VOLATILE ORGANICS BY GC/MS		SW8260B				Analyst: <b>CK</b>
o-Xylene	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
sec-Butylbenzene	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
Styrene	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
tert-Butylbenzene	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
Tetrachloroethene	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
Toluene	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
trans-1,2-Dichloroethene	ND	10.0		μg/Kg	1	2/17/2015 11:29:00 AM
trans-1,3-Dichloropropene	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
Trichloroethene	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
Trichlorofluoromethane	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
Vinyl chloride	ND	10.0		µg/Kg	1	2/17/2015 11:29:00 AM
Surr: 1,2-Dichloroethane-d4	101	71.5-112		%REC	1	2/17/2015 11:29:00 AM
Surr: 4-Bromofluorobenzene	109	75.7-122		%REC	1	2/17/2015 11:29:00 AM
Surr: Dibromofluoromethane	99.9	64.3-124		%REC	1	2/17/2015 11:29:00 AM
Surr: Toluene-d8	80.2	74.9-120		%REC	1	2/17/2015 11:29:00 AM
PCB'S IN SOLIDS		SW 8082A				Analyst: BS
Aroclor 1016	ND	0.333		µg/Kg	1	2/20/2015 11:13:00 PM
Aroclor 1221	ND	0.333		µg/Kg	1	2/20/2015 11:13:00 PM
Aroclor 1232	ND	0.333		µg/Kg	1	2/20/2015 11:13:00 PM
Aroclor 1242	ND	0.333		µg/Kg	1	2/20/2015 11:13:00 PM
Aroclor 1248	ND	0.333		µg/Kg	1	2/20/2015 11:13:00 PM
Aroclor 1254	ND	0.333		µg/Kg	1	2/20/2015 11:13:00 PM
Aroclor 1260	ND	0.333		μg/Kg	1	2/20/2015 11:13:00 PM
Aroclor 1262	ND	0.333		µg/Kg	1	2/20/2015 11:13:00 PM
Aroclor 1268	ND	0.333		µg/Kg	1	2/20/2015 11:13:00 PM
Surr: Decachlorobiphenyl	78.5	56.5-130		%REC	1	2/20/2015 11:13:00 PM
CYANIDE		SW9012B				Analyst: <b>EFH</b>
Cyanide, Total	0.0339	0.0200		mg/Kg	1	2/18/2015 11:20:45 AM

WO#:

1502126

25-Feb-15

**Specialty Analytical** 

**Client:** 

Maul Foster & Alongi

**Project:** Siltronic IDW / 8128.01.08/08 TestCode: 6020\_TCLP

Sample ID: ICV Client ID: ICV	SampType: ICV  Batch ID: 8938		TestCode: 6020_TCLP Units: μg/L TestNo: E1311/6020 SW3010A			Prep Date: Analysis Date: 2/18/2015				RunNo: <b>18928</b> SeqNo: <b>251085</b>		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Arsenic, TCLP	49.6	0.100	50.00	0	99.1	90	110					
Barium, TCLP	47.9	1.00	50.00	0	95.7	90	110					
Cadmium, TCLP	47.9	0.100	50.00	0	95.8	90	110					
Chromium, TCLP	50.2	0.100	50.00	0	100	90	110					
Lead, TCLP	47.8	0.100	50.00	0	95.6	90	110					
Selenium, TCLP	52.1	1.00	50.00	0	104	90	110					
Silver, TCLP	47.8	0.100	50.00	0	95.6	90	110					

Sample ID: CCV	SampType: CCV	TestCode: 6020_TCLP Units: µg/L			Prep Date:				RunNo: 18928		
Client ID: CCV	Batch ID: 8938	TestN	No: <b>E1311/602</b>	0 SW3010A		Analysis Da	te: <b>2/18/20</b>	15	SeqNo: <b>251</b>	087	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	48.7	0.100	50.00	0	97.5	90	110				
Barium, TCLP	48.9	1.00	50.00	0	97.8	90	110				
Cadmium, TCLP	50.0	0.100	50.00	0	100	90	110				
Chromium, TCLP	49.9	0.100	50.00	0	99.7	90	110				
Lead, TCLP	49.9	0.100	50.00	0	99.7	90	110				
Selenium, TCLP	47.5	1.00	50.00	0	95.0	90	110				
Silver, TCLP	50.1	0.100	50.00	0	100	90	110				

Analyte detected in the associated Method Blank Qualifiers:

Holding times for preparation or analysis exceeded Η

ND Not Detected at the Reporting Limit

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WO#:

1502126

25-Feb-15

**Specialty Analytical** 

Maul Foster & Alongi **Client:** 

**Project:** Siltronic IDW / 8128.01.08/08 TestCode: 6020\_TCLP

Sample ID: MB-8938 Client ID: PBW	SampType: MBLK Batch ID: 8938		e: 6020_TCL o: E1311/602		Prep Date: <b>2/17/2015</b> Analysis Date: <b>2/18/2015</b>			RunNo: <b>189</b> SeqNo: <b>25</b> 1			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	ND	0.100									
Barium, TCLP	ND	1.00									
Cadmium, TCLP	ND	0.100									
Chromium, TCLP	ND	0.100									
Lead, TCLP	ND	0.100									
Selenium, TCLP	ND	1.00									
Silver, TCLP	ND	0.100									

Sample ID: LCS-8938	SampType: LCS	TestCod	de: <b>6020_TCLI</b>	P Units: μg/L	Prep Date: 2/17/2015			15	RunNo: 18928		
Client ID: LCSW	Batch ID: 8938	TestN	lo: <b>E1311/602</b> 0	0 SW3010A	Analysis Date: 2/18/2015			SeqNo: <b>251090</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	45.8	0.100	50.00	0	91.6	80	120				
Barium, TCLP	50.5	1.00	50.00	0	101	80	120				
Cadmium, TCLP	50.3	0.100	50.00	0	101	80	120				
Chromium, TCLP	46.5	0.100	50.00	0	93.1	80	120				
Lead, TCLP	50.3	0.100	50.00	0	101	80	120				
Selenium, TCLP	44.5	1.00	50.00	0	88.9	80	120				
Silver, TCLP	51.0	0.100	50.00	0	102	80	120				

Analyte detected in the associated Method Blank Qualifiers:

Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

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Η

WO#:

1502126

25-Feb-15

**Specialty Analytical** 

Maul Foster & Alongi **Client:** 

**Project:** Siltronic IDW / 8128.01.08/08 TestCode: 6020\_TCLP

Sample ID: A1502141-001BDUP Client ID: ZZZZZZ	SampType: DUP Batch ID: 8938		e: <b>6020_TCL</b> o: <b>E1311/602</b>			Prep Da Analysis Da	te: <b>2/17/20</b>		RunNo: <b>189</b> SeqNo: <b>25</b> 1		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	30.4	0.100						30.72	1.15	20	
Barium, TCLP	23.6	1.00						32.63	32.2	20	R
Cadmium, TCLP	ND	0.100						0	0	20	
Chromium, TCLP	ND	0.100						0.1058	200	20	RF
Lead, TCLP	0.115	0.100						0.1273	10.4	20	
Selenium, TCLP	ND	1.00						0	0	20	
Silver, TCLP	ND	0.100						0	0	20	

Sample ID: ICV	SampType: ICV	TestCod	de: <b>6020_TCLI</b>	P Units: μg/L	Prep Date:				RunNo: <b>18928</b>		
Client ID: ICV	Batch ID: 8938	TestN	lo: <b>E1311/602</b> 0	0 SW3010A	Analysis Date: <b>2/19/2015</b>			15	SeqNo: <b>251363</b>		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	49.1	0.100	50.00	0	98.1	90	110				
Barium, TCLP	48.5	1.00	50.00	0	97.1	90	110				
Cadmium, TCLP	48.5	0.100	50.00	0	97.0	90	110				
Chromium, TCLP	47.8	0.100	50.00	0	95.7	90	110				
Lead, TCLP	47.5	0.100	50.00	0	95.0	90	110				
Selenium, TCLP	49.1	1.00	50.00	0	98.2	90	110				
Silver, TCLP	47.0	0.100	50.00	0	94.0	90	110				

Analyte detected in the associated Method Blank Qualifiers:

Η

ND Not Detected at the Reporting Limit

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Holding times for preparation or analysis exceeded

WO#: 150

1502126

25-Feb-15

**Specialty Analytical** 

Client: Maul Foster & Alongi

Project: Siltronic IDW / 8128.01.08/08 TestCode: 6020\_TCLP

Sample ID: A1502141-001BMS Client ID: ZZZZZZ	SampType: MS Batch ID: 8938		de: 6020_TCL do: E1311/602		Prep Date: <b>2/17/2015</b> Analysis Date: <b>2/19/2015</b>			RunNo: <b>189</b> SeqNo: <b>25</b> 1			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	78.2	0.100	50.00	30.72	94.9	70	130				
Barium, TCLP	70.7	1.00	50.00	32.63	76.2	70	130				
Cadmium, TCLP	48.7	0.100	50.00	0.01392	97.4	70	130				
Chromium, TCLP	44.7	0.100	50.00	0.1058	89.2	70	130				
Lead, TCLP	48.8	0.100	50.00	0.1273	97.3	70	130				
Selenium, TCLP	44.4	1.00	50.00	0	88.8	70	130				
Silver, TCLP	47.3	0.100	50.00	0	94.7	70	130				

Sample ID: A1502141-001BMSD	SampType: MSD	TestCod	de: <b>6020_TCL</b>	P Units: μg/L		Prep Da	te: <b>2/17/20</b>	15	RunNo: <b>18</b> 9	928	
Client ID: ZZZZZZ	Batch ID: 8938	TestN	No: <b>E1311/602</b>	0 SW3010A		Analysis Da	te: <b>2/19/20</b>	15	SeqNo: <b>25</b> 1	1369	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	76.7	0.100	50.00	30.72	92.0	70	130	78.16	1.86	20	
Barium, TCLP	68.5	1.00	50.00	32.63	71.8	70	130	70.72	3.17	20	
Cadmium, TCLP	48.1	0.100	50.00	0.01392	96.3	70	130	48.71	1.18	20	
Chromium, TCLP	43.4	0.100	50.00	0.1058	86.6	70	130	44.73	3.02	20	
Lead, TCLP	47.2	0.100	50.00	0.1273	94.1	70	130	48.78	3.33	20	
Selenium, TCLP	44.4	1.00	50.00	0	88.8	70	130	44.38	0.0225	20	
Silver, TCLP	46.6	0.100	50.00	0	93.2	70	130	47.33	1.58	20	

Qualifiers: B Analyte detected in the associated Method Blank

R RPD outside accepted recovery limits

Η

Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

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O RSD is greater than RSDlimit

WO#:

1502126

25-Feb-15

**Specialty Analytical** 

Client: Maul Foster & Alongi

Project: Siltronic IDW / 8128.01.08/08 TestCode: 6020\_TCLP

Sample ID: CCV Client ID: CCV	SampType: CCV Batch ID: 8938		de: <b>6020_TCL</b> l lo: <b>E1311/602</b>		Prep Date: Analysis Date: 2/19/2015			,			RunNo: <b>18928</b> SeqNo: <b>251373</b>		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual		
Arsenic, TCLP	48.4	0.100	50.00	0	96.7	90	110						
Barium, TCLP	49.5	1.00	50.00	0	99.1	90	110						
Cadmium, TCLP	49.4	0.100	50.00	0	98.7	90	110						
Chromium, TCLP	46.9	0.100	50.00	0	93.9	90	110						
Lead, TCLP	48.7	0.100	50.00	0	97.4	90	110						
Selenium, TCLP	47.7	1.00	50.00	0	95.4	90	110						
Silver, TCLP	47.9	0.100	50.00	0	95.8	90	110						

Sample ID: CCV	SampType: CCV	TestCod	TestCode: 6020_TCLP Units: µg/L		Prep Date:				RunNo: 189		
Client ID: CCV	Batch ID: 8938	TestN	lo: <b>E1311/602</b>	0 SW3010A		Analysis Da	te: <b>2/19/20</b>	15	SeqNo: <b>251</b>	384	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	49.1	0.100	50.00	0	98.2	90	110				
Barium, TCLP	49.8	1.00	50.00	0	99.6	90	110				
Cadmium, TCLP	49.9	0.100	50.00	0	99.7	90	110				
Chromium, TCLP	47.8	0.100	50.00	0	95.7	90	110				
Lead, TCLP	48.6	0.100	50.00	0	97.2	90	110				
Selenium, TCLP	49.6	1.00	50.00	0	99.1	90	110				
Silver, TCLP	48.2	0.100	50.00	0	96.4	90	110				

Qualifiers: B Analyte

Analyte detected in the associated Method Blank

R RPD outside accepted recovery limits

Η

Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

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ND Not Detected at the Reporting Limit

Spike Recovery outside accepted recove

WO#: 150

1502126

25-Feb-15

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<b>Specialty</b>	Analytical
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Qualifiers:

Analyte detected in the associated Method Blank

RSD is greater than RSDlimit

	l Foster & Alongi onic IDW / 8128.01.08/08						TestCode:	8082LL_S		
Sample ID: CCV	SampType: <b>CCV</b>	TestCod	e: <b>8082LL_S</b>	Units: µg/Kg		Prep Date	e:	RunNo: <b>189</b>	71	
Client ID: CCV	Batch ID: 8948	TestN	o: <b>SW 8082A</b>	3545_8082LL		Analysis Date	e: <b>2/20/2015</b>	SeqNo: <b>251</b>	775	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016/1260	69.0	0.333	66.67	0	104	85	115			
Sample ID: MB-8948	SampType: MBLK	TestCod	e: <b>8082LL_S</b>	Units: µg/Kg		Prep Date	e: 2/18/2015	RunNo: <b>189</b>	71	
Client ID: PBS	Batch ID: 8948	TestN	o: <b>SW 8082A</b>	3545_8082LL		Analysis Date	e: <b>2/20/2015</b>	SeqNo: <b>251</b>	776	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016	ND	0.333								
Aroclor 1221	ND	0.333								
Aroclor 1232	ND	0.333								
Aroclor 1242	ND	0.333								
Aroclor 1248	ND	0.333								
Aroclor 1254	ND	0.333								
Aroclor 1260	ND	0.333								
Aroclor 1262	ND	0.333								
Aroclor 1268	ND	0.333								
Surr: Decachlorobipheny	yl 7010		6667		105	56.5	130			
Sample ID: LCS-8948	SampType: LCS	TestCod	e: <b>8082LL_S</b>	Units: µg/Kg		Prep Date	e: 2/18/2015	RunNo: <b>189</b>	71	
Client ID: LCSS	Batch ID: 8948	TestN	o: <b>SW 8082A</b>	3545_8082LL		Analysis Date	e: <b>2/20/2015</b>	SeqNo: <b>251</b>	777	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016/1260	75.5	0.333	66.67	0	113	44.3	137			

Holding times for preparation or analysis exceeded

RPD outside accepted recovery limits

Η

WO#: **1502126** 

25-Feb-15

# **Specialty Analytical**

	al Foster & Alongi conic IDW / 8128.01.08/08					TestCode: 8	8082LL_S	
Sample ID: <b>PCB 1254</b> @1		TestCode: 8082LL_S	Units: µg/Kg		Prep Date:		RunNo: <b>18971</b>	
Client ID: CCV	Batch ID: 8948	TestNo: SW 8082A	3545_8082LL	,	Analysis Date: 2/23/	2015	SeqNo: <b>251784</b>	
Analyte	Result	PQL SPK value	SPK Ref Val	%REC	LowLimit HighLim	it RPD Ref Val	%RPD RPDLimit	Qual
Aroclor 1254	66.7	0.333 66.67	0	100	85 11	5		
Sample ID: <b>1502129-003</b>	BMS SampType: MS	TestCode: 8082LL_S	Units: µg/Kg		Prep Date: <b>2/18/</b>	2015	RunNo: <b>18971</b>	
Client ID: ZZZZZZ	Batch ID: 8948	TestNo: SW 8082A	3545_8082LL	,	Analysis Date: 2/21/	2015	SeqNo: <b>251785</b>	
Analyte	Result	PQL SPK value	SPK Ref Val	%REC	LowLimit HighLim	it RPD Ref Val	%RPD RPDLimit	Qual
Aroclor 1016/1260	28.3	0.333 66.67	0	42.5	56.6 12	3		SMI
Sample ID: <b>1502129-003</b>	BMSD SampType: MSD	TestCode: 8082LL_S	Units: µg/Kg		Prep Date: <b>2/18/</b>	2015	RunNo: <b>18971</b>	
Client ID: ZZZZZZ	Batch ID: 8948	TestNo: SW 8082A	3545_8082LL	,	Analysis Date: 2/21/	2015	SeqNo: <b>251790</b>	
Analyte	Result	PQL SPK value	SPK Ref Val	%REC	LowLimit HighLim	it RPD Ref Val	%RPD RPDLimit	Qual
Aroclor 1016/1260	32.6	0.333 66.67	0	48.9	56.6 12	3 28.34	14.0 20	SMI
Sample ID: CCV	SampType: CCV	TestCode: 8082LL_S	Units: µg/Kg		Prep Date:		RunNo: <b>18971</b>	
Client ID: CCV	Batch ID: 8948	TestNo: SW 8082A	3545_8082LL	,	Analysis Date: 2/21/	2015	SeqNo: <b>251797</b>	
Analyte	Result	PQL SPK value	SPK Ref Val	%REC	LowLimit HighLim	it RPD Ref Val	%RPD RPDLimit	Qual
Aroclor 1016/1260	67.8	0.333 66.67	0	102	85 11	5		

Qualifiers: B Analyte detected in the associated Method Blank

ND Not Detected at the Reporting Limit

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R RPD outside accepted recovery limits

Holding times for preparation or analysis exceeded

WO#:

1502126

25-Feb-15

**Specialty Analytical** 

Client: Maul	Foster & Alongi
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Project: Siltronic II	OW / 8128.01.08/08						1	CestCode: 8	260_S			
Sample ID: CCV MSVWS-2015	SampType: CCV	TestCoo	le: <b>8260_S</b>	Units: µg/Kg		Prep Date	э:		RunNo: 188	95		
Client ID: CCV	Batch ID: 8936	TestN	lo: <b>SW8260B</b>	8260B 5030 Analysis Date: 2/16/2015 SeqNo: 250319			Analysis Date: 2/16/2015			319		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qua	
1,1-Dichloroethene	77.7	10.0	80.00	0	97.2	80	120					
1,2-Dichloropropane	75.7	10.0	80.00	0	94.6	80	120					
Chloroform	79.2	10.0	80.00	0	99.0	80	120					
Ethylbenzene	92.4	10.0	80.00	0	115	80	120					
Toluene	67.8	10.0	80.00	0	84.8	80	120					
Vinyl chloride	76.9	10.0	80.00	0	96.1	80	120					
Sample ID: LCS MSVWS-2016	SampType: <b>LCS</b>	TestCod	le: <b>8260_S</b>	Units: µg/Kg		Prep Date	e:		RunNo: 188	95		
Client ID: LCSS	Batch ID: 8936	TestN	lo: <b>SW8260B</b>	5030		Analysis Date	e: <b>2/16/20</b>	15	SeqNo: <b>250320</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qua	
1,1-Dichloroethene	35.5	10.0	40.00	0	88.8	85.1	136					
Benzene	40.3	10.0	40.00	0	101	87.5	130					
Chlorobenzene	43.1	10.0	40.00	0	108	84.4	130					
Toluene	34.4	10.0	40.00	0	86.1	83.7	127					
Trichloroethene	40.6	10.0	40.00	0	102	88.5	123					
Sample ID: MB	SampType: MBLK	TestCod	le: <b>8260_S</b>	Units: µg/Kg		Prep Date	e:		RunNo: <b>188</b>	95		
Client ID: PBS	Batch ID: 8936	TestN	lo: <b>SW8260B</b>	5030		Analysis Date	e: <b>2/16/20</b>	15	SeqNo: 250	321		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qua	
1,1,1,2-Tetrachloroethane	ND	10.0										
	ND	10.0										

RSD is greater than RSDlimit

RPD outside accepted recovery limits

WO#:

1502126

25-Feb-15

Maul Foster & Alongi

**Specialty Analytical** 

**Client:** 

**Project:** Siltronic IDW / 8128.01.08/08 TestCode: 8260\_S

Sample ID: MB	SampType: MBLK	TestCod	e: <b>8260_S</b>	Units: µg/Kg		Prep Da	ite:		RunNo: 188	95	
Client ID: PBS	Batch ID: 8936	TestN	o: <b>SW8260B</b>	5030	Analysis Date: 2/16/2015			SeqNo: 250	321		
Analyta	Dooult	DOL	CDK value	SPK Ref Val	%REC	Loudinait	lliabliasit	DDD Def Vel	%RPD	RPDLimit	Ougl
Analyte	Result	PQL	SPK value	SPK Rei Vai	%REC	LowLimit	nignLimit	RPD Ref Val	%RPD	RPDLIMIL	Qual
1,1,2,2-Tetrachloroethane	ND	10.0									
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	10.0									
1,1,2-Trichloroethane	ND	10.0									
1,1-Dichloroethane	ND	10.0									
1,1-Dichloroethene	ND	10.0									
1,1-Dichloropropene	ND	10.0									
1,2,3-Trichlorobenzene	ND	10.0									
1,2,3-Trichloropropane	ND	10.0									
1,2,4-Trichlorobenzene	ND	10.0									
1,2,4-Trimethylbenzene	ND	10.0									
1,2-Dibromo-3-chloropropane	ND	10.0									
1,2-Dibromoethane	ND	10.0									
1,2-Dichlorobenzene	ND	10.0									
1,2-Dichloroethane	ND	10.0									
1,2-Dichloropropane	ND	10.0									
1,3,5-Trimethylbenzene	ND	10.0									
1,3-Dichlorobenzene	ND	10.0									
1,3-Dichloropropane	ND	10.0									
1,4-Dichlorobenzene	ND	10.0									
2,2-Dichloropropane	ND	10.0									
2-Butanone	ND	20.0									
2-Chlorotoluene	ND	10.0									
2-Hexanone	ND	20.0									
4-Chlorotoluene	ND	10.0									
4-Isopropyltoluene	ND	10.0									
4-Methyl-2-pentanone	ND	20.0									

Qualifiers:

Analyte detected in the associated Method Blank

RSD is greater than RSDlimit

Holding times for preparation or analysis exceeded

RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit

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WO#:

1502126

25-Feb-15

**Specialty Analytical** 

Maul Foster & Alongi **Client:** 

**Project:** Siltronic IDW / 8128.01.08/08 TestCode: 8260\_S

Sample ID: MB	SampType: MBLK	TestCode: 8260_S	Units: µg/Kg	Prep Date:		RunNo: <b>18895</b>	
Client ID: PBS	Batch ID: <b>8936</b>	TestNo: SW8260E	5030	Analysis Date:	2/16/2015	SeqNo: <b>250321</b>	
Analyte	Result	PQL SPK value	SPK Ref Val	%REC LowLimit H	HighLimit RPD Ref Val	%RPD RPDLimit	Qual
Acetone	ND	50.0					
Benzene	ND	10.0					
Bromobenzene	ND	10.0					
Bromochloromethane	ND	10.0					
Bromodichloromethane	ND	10.0					
Bromoform	ND	10.0					
Bromomethane	ND	10.0					
Carbon disulfide	ND	10.0					
Carbon tetrachloride	ND	10.0					
Chlorobenzene	ND	10.0					
Chloroethane	ND	10.0					
Chloroform	ND	10.0					
Chloromethane	ND	10.0					
cis-1,2-Dichloroethene	ND	10.0					
cis-1,3-Dichloropropene	ND	10.0					
Dibromochloromethane	ND	10.0					
Dibromomethane	ND	10.0					
Dichlorodifluoromethane	ND	10.0					
Ethylbenzene	ND	10.0					
Hexachlorobutadiene	ND	10.0					
Isopropylbenzene	ND	10.0					
m,p-Xylene	ND	20.0					
Methyl tert-butyl ether	ND	10.0					
Methylene chloride	ND	50.0					
Naphthalene	ND	10.0					
n-Butylbenzene	ND	10.0					
Qualifiers: B Analyte dete	ected in the associated Method Bla	nk H Hold	ing times for preparation	or analysis exceeded	ND Not Detected at the	Reporting Limit Pag	ge 10 of 30

RPD outside accepted recovery limits

RSD is greater than RSDlimit

WO#:

1502126

25-Feb-15

**Specialty Analytical** 

Client: Maul Foster & Alongi

<b>Project:</b> Siltronic II	OW / 8128.01.08/08					TestCode: 8	3260_S	
Sample ID: MB	SampType: MBLK	TestCode: 8260_S	Units: µg/Kg		Prep Date	e:	RunNo: <b>18895</b>	
Client ID: PBS	Batch ID: 8936	TestNo: SW8260B	5030		Analysis Date	e: <b>2/16/2015</b>	SeqNo: <b>250321</b>	
Analyte	Result	PQL SPK value	SPK Ref Val	%REC	LowLimit	HighLimit RPD Ref Val	%RPD RPDLimit	Qual
n-Propylbenzene	ND	10.0						
o-Xylene	ND	10.0						
sec-Butylbenzene	ND	10.0						
Styrene	ND	10.0						
ert-Butylbenzene	ND	10.0						
Tetrachloroethene	ND	10.0						
Toluene	ND	10.0						
rans-1,2-Dichloroethene	ND	10.0						
rans-1,3-Dichloropropene	ND	10.0						
richloroethene	ND	10.0						
richlorofluoromethane	ND	10.0						
/inyl chloride	ND	10.0						
Surr: 1,2-Dichloroethane-d4	90.8	100.0		90.8	71.5	112		
Surr: 4-Bromofluorobenzene	96.7	100.0		96.7	75.7	122		
Surr: Dibromofluoromethane	94.8	100.0		94.8	64.3	124		
Surr: Toluene-d8	107	100.0		107	74.9	120		
Sample ID: <b>1502116-001AMS</b>	SampType: MS	TestCode: 8260_S	Units: µg/Kg		Prep Date	e: <b>2/16/2015</b>	RunNo: <b>18895</b>	
Client ID: ZZZZZZ	Batch ID: 8936	TestNo: SW8260B	5030		Analysis Date	e: <b>2/16/2015</b>	SeqNo: <b>250325</b>	
Analyte	Result	PQL SPK value	SPK Ref Val	%REC	LowLimit	HighLimit RPD Ref Val	%RPD RPDLimit	Qua
1,1-Dichloroethene	42800	10000 40000	0	107	46.6	147		
Benzene	42600	10000 40000	0	107	65.2	121		
Chlorobenzene	45600	10000 40000	0	114	40.9	122		
Qualifiers: B Analyte detec	cted in the associated Method Bl	lank H Holdii	ng times for preparation	or analysis	exceeded	ND Not Detected at th	e Reporting Limit Pag	ge 11 (
=	er than RSDlimit		outside accepted recover	-			utside accepted recov	,0 11

Spike Recovery outside accepted recove

WO#: 1:

1502126

25-Feb-15

**Specialty Analytical** 

Client: Maul	Foster & Alongi
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RSD is greater than RSDlimit

Sample ID: <b>1502116-001AMS</b>	SampType: MS	TestCoo	de: <b>8260_S</b>	Units: µg/Kg		Prep Date	e: <b>2/16/20</b>	15	RunNo: <b>188</b>	<b>195</b>	
Client ID: ZZZZZZ	Batch ID: 8936	TestN	lo: <b>SW8260B</b>	5030		Analysis Dat	e: <b>2/16/20</b>	15	SeqNo: <b>250</b>	325	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Toluene	47000	10000	40000	5600	103	52.1	127				
Trichloroethene	44300	10000	40000	0	111	57.6	122				
Sample ID: <b>1502116-001AMSD</b>	SampType: MSD	TestCoo	de: <b>8260_S</b>	Units: µg/Kg		Prep Date	e: <b>2/16/20</b>	15	RunNo: 188	395	
Client ID: ZZZZZZ	Batch ID: 8936	TestN	lo: <b>SW8260B</b>	5030		Analysis Dat	e: <b>2/16/20</b>	15	SeqNo: <b>250</b>	326	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	49600	10000	40000	0	124	46.6	147	42790	14.6	30	
Benzene	42500	10000	40000	0	106	65.2	121	42610	0.235	30	
Chlorobenzene	43000	10000	40000	0	108	40.9	122	45570	5.69	30	
Toluene	48000	10000	40000	5600	106	52.1	127	46970	2.11	30	
Trichloroethene	45500	10000	40000	0	114	57.6	122	44330	2.67	30	
Sample ID: CCV MSVWS-2015	SampType: CCV	TestCoo	de: <b>8260_S</b>	Units: µg/Kg		Prep Date	e:		RunNo: 188		
Client ID: CCV	Batch ID: 8936	TestN	lo: <b>SW8260B</b>	5030		Analysis Date	e: <b>2/17/20</b>	15	SeqNo: <b>250</b>	786	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	39.8	10.0	40.00	0	99.4	80	120				
1,2-Dichloropropane	41.2	10.0	40.00	0	103	80	120				
Chloroform	44.0	10.0	40.00	0	110	80	120				
Ethylbenzene	44.6	10.0	40.00	0	112	80	120				
Toluene	33.9	10.0	40.00	0	84.6	80	120				
Vinyl chloride	34.1	10.0	40.00	0	85.3	80	120				

RPD outside accepted recovery limits

WO#:

1502126

25-Feb-15

Maul Foster & Alongi **Client:** 

**Specialty Analytical** 

Siltronic IDW / 8128.01.08/08 TestCode: 8260 S **Project:** 

Sample ID: CCV MSVWS-2015 SampType: CCV TestCode: 8260\_S Units: µg/Kg Prep Date: RunNo: 18895

Client ID: CCV Batch ID: 8936 TestNo: SW8260B 5030 Analysis Date: 2/17/2015 SeqNo: 250786

Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD **RPDLimit** Qual

Sample ID: CCB	SampType: CCB	TestCode:	8260_S	Units: µg/Kg					RunNo: <b>188</b>	95	
Client ID: CCB	Batch ID: <b>8936</b>	TestNo:	SW8260B	5030		Analysis Da	te: <b>2/17/2</b> 0	15	SeqNo: <b>250</b>	787	
Analyte	Result	PQL S	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	10.0									
1,1,1-Trichloroethane	ND	10.0									
1,1,2,2-Tetrachloroethane	ND	10.0									
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	10.0									
1,1,2-Trichloroethane	ND	10.0									
1,1-Dichloroethane	ND	10.0									
1,1-Dichloroethene	ND	10.0									
1,1-Dichloropropene	ND	10.0									
1,2,3-Trichlorobenzene	ND	10.0									
1,2,3-Trichloropropane	ND	10.0									
1,2,4-Trichlorobenzene	ND	10.0									
1,2,4-Trimethylbenzene	ND	10.0									
1,2-Dibromo-3-chloropropane	ND	10.0									
1,2-Dibromoethane	ND	10.0									
1,2-Dichlorobenzene	ND	10.0									
1,2-Dichloroethane	ND	10.0									
1,2-Dichloropropane	ND	10.0									
1,3,5-Trimethylbenzene	ND	10.0									
1,3-Dichlorobenzene	ND	10.0									

Qualifiers: Analyte detected in the associated Method Blank

Η

Not Detected at the Reporting Limit

Spike Recovery outside accepted recove

Page 13 of 30

RSD is greater than RSDlimit

RPD outside accepted recovery limits

Holding times for preparation or analysis exceeded

WO#:

1502126

25-Feb-15

**Specialty Analytical** 

Client: Maul Foster & Alongi

**Project:** Siltronic IDW / 8128.01.08/08 **TestCode: 8260\_S** 

Sample ID: CCB	SampType: CCB	TestCoo	le: <b>8260_S</b>	Units: µg/Kg					RunNo: <b>188</b>	395	
Client ID: CCB	Batch ID: 8936	TestN	lo: <b>SW8260B</b>	5030		Analysis Da	ate: <b>2/17/2</b> 0	)15	SeqNo: <b>250</b>	787	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,3-Dichloropropane	ND	10.0									
1,4-Dichlorobenzene	ND	10.0									
2,2-Dichloropropane	ND	10.0									
2-Butanone	ND	20.0									
2-Chlorotoluene	ND	10.0									
2-Hexanone	ND	20.0									
4-Chlorotoluene	ND	10.0									
4-Isopropyltoluene	ND	10.0									
4-Methyl-2-pentanone	ND	20.0									
Acetone	ND	50.0									
Benzene	ND	10.0									
Bromobenzene	ND	10.0									
Bromochloromethane	ND	10.0									
Bromodichloromethane	ND	10.0									
Bromoform	ND	10.0									
Bromomethane	ND	10.0									
Carbon disulfide	ND	10.0									
Carbon tetrachloride	ND	10.0									
Chlorobenzene	ND	10.0									
Chloroethane	ND	10.0									
Chloroform	ND	10.0									
Chloromethane	ND	10.0									
cis-1,2-Dichloroethene	ND	10.0									
cis-1,3-Dichloropropene	ND	10.0									
Dibromochloromethane	ND	10.0									
Dibromomethane	ND	10.0									

Qualifiers:

Analyte detected in the associated Method Blank

Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

Page 14 of 30

O RSD is greater than RSDlimit

RPD outside accepted recovery limits

WO#:

1502126

25-Feb-15

**Specialty Analytical** 

Maul Foster & Alongi **Client:** 

**Project:** Siltronic IDW / 8128.01.08/08 TestCode: 8260\_S

Sample ID: CCB	SampType: CCB	TestCod	de: <b>8260_S</b>	Units: µg/Kg		Prep Dat	e:		RunNo: <b>188</b>	95	
Client ID: CCB	Batch ID: 8936	TestN	lo: <b>SW8260B</b>	5030		Analysis Dat	e: <b>2/17/20</b>	15	SeqNo: <b>250</b>	787	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dichlorodifluoromethane	ND	10.0									
Ethylbenzene	ND	10.0									
Hexachlorobutadiene	ND	10.0									
sopropylbenzene	ND	10.0									
n,p-Xylene	ND	20.0									
Methyl tert-butyl ether	ND	10.0									
Methylene chloride	ND	50.0									
Naphthalene	ND	10.0									
-Butylbenzene	ND	10.0									
-Propylbenzene	ND	10.0									
-Xylene	ND	10.0									
ec-Butylbenzene	ND	10.0									
Styrene	ND	10.0									
ert-Butylbenzene	ND	10.0									
Tetrachloroethene	ND	10.0									
Toluene	ND	10.0									
rans-1,2-Dichloroethene	ND	10.0									
rans-1,3-Dichloropropene	ND	10.0									
Trichloroethene	ND	10.0									
Frichlorofluoromethane	ND	10.0									
/inyl chloride	ND	10.0									
Surr: 1,2-Dichloroethane-d4	104		100.0		104	71.5	112				
Surr: 4-Bromofluorobenzene	97.0		100.0		97.0	75.7	122				
Surr: Dibromofluoromethane	110		100.0		110	64.3	124				
Surr: Toluene-d8	102		100.0		102	74.9	120				

O RSD is greater than RSDlimit

R RPD outside accepted recovery limits

1502126 WO#:

25-Feb-15

# **Specialty Analytical**

Maul Foster & Alongi **Client:** 

Duoinate Siltronic IDW / 8128 01 08/08 ToctCodo 9270TT C

Sample ID: CCV-8941	SampType: CCV	TestCo	de: <b>8270LL_S</b>	Units: µg/Kg		Prep Date	:		RunNo: <b>189</b>	926	
Client ID: CCV	Batch ID: <b>8941</b>	TestN	lo: <b>SW8270D</b>	SW 3545A		Analysis Date	2/18/20	15	SeqNo: <b>250</b>	892	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,4-Dichlorobenzene	1120	33.3	1333	0	84.2	80	120				
2,4,6-Trichlorophenol	1490	33.3	1333	0	112	80	120				
2,4-Dichlorophenol	1440	33.3	1333	0	108	80	120				
2-Nitrophenol	1520	167	1333	0	114	80	120				
1-Chloro-3-methylphenol	1530	33.3	1333	0	115	80	120				
Acenaphthene	1580	33.3	1333	0	118	80	120				
Benzo(a)pyrene	1560	33.3	1333	0	117	80	120				
Di-n-octyl phthalate	1550	33.3	1333	0	117	80	120				
Fluoranthene	1580	33.3	1333	0	119	80	120				
Hexachlorobutadiene	1500	33.3	1333	0	112	80	120				
N-Nitrosodiphenylamine	1510	33.3	1333	0	113	80	120				
Pentachlorophenol	1080	50.0	1333	0	80.9	80	120				
Phenol	1580	33.3	1333	0	119	80	120				
Sample ID: LCS-8941	SampType: <b>LCS</b>	TestCoo	de: <b>8270LL_S</b>	Units: µg/Kg		Prep Date	: 2/17/20	15	RunNo: 189	926	
Client ID: LCSS	Batch ID: <b>8941</b>	TestN	lo: <b>SW8270D</b>	SW 3545A		Analysis Date	2/18/20	15	SeqNo: <b>250</b>	893	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qua
,2,4-Trichlorobenzene	1320	33.3	1667	0	79.2	30.9	106				
	1130	33.3	1667	0	68.0	31.4	98.2				
,4-Dichlorobenzene	4000	33.3	1667	0	79.6	59.7	111				
•	1330										
2,4-Dinitrotoluene	1330 1390	33.3	1667	0	83.7	46.2	105				
,4-Dichlorobenzene 2,4-Dinitrotoluene 2-Chlorophenol I-Chloro-3-methylphenol			1667 1667	0 0	83.7 109	46.2 47.4	105 114				

Analyte detected in the associated Method Blank

ND Not Detected at the Reporting Limit

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RSD is greater than RSDlimit

RPD outside accepted recovery limits

WO#:

1502126

25-Feb-15

# **Specialty Analytical**

Client: Maul Foster & Alongi

Project: Siltronic	IDW / 8128.01.08/08						Т	estCode: 8	3270LL_S		
Sample ID: LCS-8941 Client ID: LCSS	SampType: LCS Batch ID: 8941		de: 8270LL_S	Units: µg/Kg SW 3545A		Prep Date	e: 2/17/20 e: 2/18/20		RunNo: <b>189</b> SeqNo: <b>250</b>		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	1600	33.3	1667	0	95.8	48.2	105				
N-Nitrosodi-n-propylamine	1690	33.3	1667	0	102	42.4	101				SO
Pentachlorophenol	843	50.0	1667	0	50.6	46.8	120				
Phenol	1600	33.3	1667	0	95.9	51.1	103				
Pyrene	1390	33.3	1667	0	83.2	56.7	130				
Sample ID: MB-8941	SampType: <b>MBLK</b>	TestCoo	de: <b>8270LL_S</b>	Units: µg/Kg		Prep Date	e: <b>2/17/20</b>	15	RunNo: 189	926	
Client ID: PBS	Batch ID: 8941	TestN	lo: <b>SW8270D</b>	SW 3545A		Analysis Date	e: <b>2/18/20</b>	15	SeqNo: <b>25</b> (	0894	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2,4-Trichlorobenzene	ND	33.3									
1,2-Dichlorobenzene	ND	33.3									
1,2-Diphenylhydrazine	ND	167									
1,3-Dichlorobenzene	ND	33.3									
1,4-Dichlorobenzene	ND	33.3									
1-Methylnaphthalene	ND	33.3									
2,4,5-Trichlorophenol	ND	33.3									
2,4,6-Trichlorophenol	ND	33.3									
2,4-Dichlorophenol	ND	33.3									
2,4-Dimethylphenol	ND	33.3									
2,4-Dinitrophenol	ND	333									
2,4-Dinitrotoluene	ND	33.3									
2,6-Dinitrotoluene	ND	33.3									
2-Chloronaphthalene	ND	33.3									

Qualifiers: B Analyte detected in the associated Method Blank

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

Page 17 of 30

O RSD is greater than RSDlimit

R RPD outside accepted recovery limits

WO#:

1502126

25-Feb-15

**Specialty Analytical** 

Maul Foster & Alongi **Client:** 

**Project:** Siltronic IDW / 8128.01.08/08 TestCode: 8270LL\_S

Sample ID: MB-8941	SampType: MBLK	TestCo	de: <b>8270LL_S</b>	Units: µg/Kg		Prep Da	ate: 2/17/20	15	RunNo: <b>189</b>	26	
Client ID: PBS	Batch ID: 8941	TestN	lo: <b>SW8270D</b>	SW 3545A		Analysis Da	ate: <b>2/18/2</b> 0	15	SeqNo: <b>250</b>	894	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
2-Chlorophenol	ND	33.3									
2-Methylnaphthalene	ND	33.3									
2-Methylphenol	ND	33.3									
2-Nitroaniline	ND	33.3									
2-Nitrophenol	ND	167									
3-&4-Methylphenol	ND	33.3									
3,3-Dichlorobenzidine	ND	167									
3-Nitroaniline	ND	33.3									
4,6-Dinitro-2-methylphenol	ND	167									
4-Bromophenyl phenyl ether	ND	33.3									
4-Chloro-3-methylphenol	ND	33.3									
4-Chloroaniline	ND	33.3									
4-Chlorophenyl phenyl ether	ND	33.3									
4-Nitroaniline	ND	33.3									
4-Nitrophenol	ND	167									
Acenaphthene	ND	33.3									
Acenaphthylene	ND	33.3									
Aniline	ND	33.3									
Anthracene	ND	33.3									
Benz(a)anthracene	ND	33.3									
Benzidine	ND	167									
Benzo(a)pyrene	ND	33.3									
Benzo(b)fluoranthene	ND	33.3									
Benzo(g,h,i)perylene	ND	33.3									
Benzo(k)fluoranthene	ND	33.3									
Benzoic Acid	ND	667									

Qualifiers:

Analyte detected in the associated Method Blank

Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

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RPD outside accepted recovery limits

WO#: 1

1502126

25-Feb-15

**Specialty Analytical** 

Client: Maul Foster & Alongi

Project: Siltronic IDW / 8128.01.08/08 TestCode: 8270LL\_S

Sample ID: MB-8941	SampType: MBLK		e: 8270LL_S	Units: µg/Kg			te: 2/17/20		RunNo: 189		
Client ID: PBS	Batch ID: <b>8941</b>	TestNo	o: <b>SW8270D</b>	SW 3545A		Analysis Da	te: <b>2/18/20</b>	15	SeqNo: <b>250</b>	)894	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzyl Alcohol	ND	33.3									
Benzyl butyl phthalate	ND	33.3									
Bis(2-chloroethoxy)methane	ND	33.3									
Bis(2-chloroethyl)ether	ND	33.3									
Bis(2-chloroisopropyl)ether	ND	33.3									
Bis(2-ethylhexyl)phthalate	ND	33.3									
Carbazole	ND	33.3									
Chrysene	ND	33.3									
Dibenz(a,h)anthracene	ND	33.3									
Dibenzofuran	ND	33.3									
Diethyl phthalate	ND	33.3									
Dimethyl phthalate	ND	33.3									
Di-n-butyl phthalate	ND	50.0									
Di-n-octyl phthalate	ND	33.3									
Fluoranthene	ND	33.3									
Fluorene	ND	33.3									
Hexachlorobenzene	ND	33.3									
Hexachlorobutadiene	ND	33.3									
Hexachlorocyclopentadiene	ND	33.3									
Hexachloroethane	ND	33.3									
Indeno(1,2,3-cd)pyrene	ND	33.3									
Isophorone	ND	33.3									
Naphthalene	ND	33.3									
Nitrobenzene	ND	33.3									
N-Nitrosodimethylamine	ND	33.3									
N-Nitrosodi-n-propylamine	ND	33.3									

Qualifiers:

Analyte detected in the associated Method Blank

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

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S Spike Recovery outside accepted recove

WO#:

1502126

25-Feb-15

# **Specialty Analytical**

**Client:** Maul Foster & Alongi

O RSD is greater than RSDlimit

Droject. Siltronic IDW / 8128 01 08/08 ToctCodo 9270TT C

Sample ID: MB-8941	SampType: MBLK	TestCo	de: <b>8270LL_S</b>	Units: µg/Kg		Prep Date	e: <b>2/17/20</b>	15	RunNo: <b>189</b>	26	
Client ID: PBS	Batch ID: 8941	Test	No: <b>SW8270D</b>	SW 3545A		Analysis Date	e: <b>2/18/20</b>	15	SeqNo: <b>250</b>	894	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
N-Nitrosodiphenylamine	ND	33.3									
Pentachlorophenol	ND	50.0									
Phenanthrene	ND	33.3									
Phenol	ND	33.3									
Pyrene	ND	33.3									
Pyridine	ND	167									
Surr: 2,4,6-Tribromophenol	2950		3333		88.6	57.8	119				
Surr: 2-Fluorobiphenyl	2710		3333		81.3	52.6	93.2				
Surr: 2-Fluorophenol	3590		3333		108	40.7	111				
Surr: 4-Terphenyl-d14	2720		3333		81.6	49.8	118				
Surr: Nitrobenzene-d5	3460		3333		104	44.8	103				S
Surr: Phenol-d6	3380		3333		102	47.5	117				
Sample ID: <b>1502126-002BMS</b>	SampType: <b>MS</b>	TestCo	de: <b>8270LL_S</b>	Units: µg/Kg		Prep Date	e: <b>2/17/20</b>	15	RunNo: 189	26	
Client ID: DRUMS-AK-SO-0-10	Batch ID: 8941	Test	No: <b>SW8270D</b>	SW 3545A		Analysis Date	e: <b>2/18/20</b>	15	SeqNo: 250	895	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qua
1,2,4-Trichlorobenzene	1040	33.3	1667	0	62.7	31.1	92.7				
1,4-Dichlorobenzene	1220	33.3	1667	0	73.1	16.5	85.6				
2,4-Dinitrotoluene	1070	33.3	1667	13.00	63.6	43.4	118				
2,4-01111101010110	968	33.3	1667	0	58.1	36.8	103				
,			4007	0	96.9	49.5	119				
2-Chlorophenol	1620	33.3	1667	U							
2-Chlorophenol 4-Chloro-3-methylphenol 4-Nitrophenol	1620 1430	33.3 167	1667 1667	0	86.0	45	111				

R RPD outside accepted recovery limits

WO#: **1502126** 

25-Feb-15

# **Specialty Analytical**

Client: Maul Foster & Alongi

Project: Siltronic IDW / 8128.01.08/08 TestCode: 8270LL\_S

Sample ID: 1502126-002BMS Client ID: DRUMS-AK-SO-0-10	SampType: MS Batch ID: 8941		de: <b>8270LL_S</b> do: <b>SW8270D</b>	Units: µg/Kg SW 3545A	Prep Date: <b>2/17/2015</b> Analysis Date: <b>2/18/2015</b>				RunNo: <b>18926</b> SeqNo: <b>250895</b>				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual		
N-Nitrosodi-n-propylamine	1180	33.3	1667	0	71.1	45.6	94.1						
Pentachlorophenol	635	50.0	1667	0	38.1	36.6	112						
Phenol	1470	33.3	1667	0	88.4	37.7	107						
Pyrene	945	33.3	1667	157.7	47.2	42.4	131						

Sample ID: 1502126-002BMSD	SampType: MSD	TestCod	de: <b>8270LL_S</b>	Units: µg/Kg		Prep Da	te: <b>2/17/20</b>	15	RunNo: 189	926	
Client ID: DRUMS-AK-SO-0-10	Batch ID: <b>8941</b>	TestN	lo: <b>SW8270D</b>	SW 3545A		Analysis Da	te: <b>2/18/20</b>	15	SeqNo: <b>250</b>	896	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2,4-Trichlorobenzene	1220	33.3	1667	0	73.0	31.1	92.7	1044	15.3	20	
1,4-Dichlorobenzene	1260	33.3	1667	0	75.6	16.5	85.6	1218	3.42	20	
2,4-Dinitrotoluene	1190	33.3	1667	13.00	70.5	43.4	118	1072	10.2	20	
2-Chlorophenol	1250	33.3	1667	0	74.9	36.8	103	968.3	25.3	20	R
4-Chloro-3-methylphenol	1610	33.3	1667	0	96.9	49.5	119	1616	0.0826	20	
4-Nitrophenol	1920	167	1667	0	115	45	111	1434	28.8	20	SR
Acenaphthene	1570	33.3	1667	31.67	92.4	45.1	102	1172	29.1	20	R
N-Nitrosodi-n-propylamine	1540	33.3	1667	0	92.6	45.6	94.1	1185	26.3	20	R
Pentachlorophenol	834	50.0	1667	0	50.0	36.6	112	635.0	27.1	20	R
Phenol	1820	33.3	1667	0	109	37.7	107	1474	20.9	20	SR
Pyrene	1650	33.3	1667	157.7	89.8	42.4	131	945.0	54.6	20	R

Qualifiers: B Analyte detected in the associated Method Blank

R RPD outside accepted recovery limits

Η

Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

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WO#: **1502126** 

25-Feb-15

# **Specialty Analytical**

Client:	Maul Foster & Alongi
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Project:	Siltronic IDW / 8	C						7	TestCode: (	CN_S		
Sample ID: R1893 Client ID: ICV		pType: ICV tch ID: R18935		le: CN_S lo: SW9012B	Units: mg/Kg		Prep Da Analysis Da		015	RunNo: 189 SeqNo: 25		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total		0.323	0.0200	0.3000	0	108	90	110				
Sample ID: MB-R	18935 Sam	рТуре: МВЬК	_			Prep Da	Prep Date:			RunNo: <b>18935</b>		
Client ID: PBS	Ba	tch ID: R18935	TestN	lo: <b>SW9012B</b>			Analysis Da	te: <b>2/18/2</b> 0	015	SeqNo: 25	1076	
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total		ND	0.0200									
Sample ID: LCS-R	R18935 Sam	рТуре: <b>LCS</b>	TestCoo	le: CN_S	Units: mg/Kg		Prep Da	te:		RunNo: <b>18935</b>		
Client ID: LCSS	Bar	tch ID: R18935	TestN	lo: <b>SW9012B</b>			Analysis Da	te: <b>2/18/2</b> 0	015	SeqNo: 25	1077	
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total		0.227	0.0200	0.2000	0	114	85	115				
Sample ID: R1893	SCCV Sam	рТуре: ССУ	TestCoo	le: CN_S	Units: mg/Kg		Prep Da	te:		RunNo: 18	935	
Client ID: CCV	Bat	tch ID: R18935	TestN	lo: <b>SW9012B</b>			Analysis Da	te: <b>2/18/2</b> 0	015	SeqNo: 25	1078	
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers: B Analyte detected in the associated Method Blank

0.368

0.0200

R RPD outside accepted recovery limits

0

Holding times for preparation or analysis exceeded

105

90

0.3500

Η

ND Not Detected at the Reporting Limit

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O RSD is greater than RSDlimit

Cyanide, Total

S Spike Recovery outside accepted recove

110

1502126 WO#:

25-Feb-15

# **Specialty Analytical**

Maul Foster & Alongi **Client:** 

Project: Siltronic II	OW / 8128.01.08/08						Т	CestCode: C	CN_S		
Sample ID: <b>1502126-001BMS</b>	SampType: MS	TestCod	e: CN_S	Units: mg/Kg		Prep Dat	te:		RunNo: 189	935	
Client ID: DRUMS-SO-10-36	Batch ID: <b>R18935</b>	TestN	o: <b>SW9012B</b>			Analysis Dat	te: <b>2/18/20</b>	15	SeqNo: 25	1082	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	1.08	0.100	0.1000	1.006	70.5	80	120				SMC
Sample ID: <b>1502126-001BMSD</b>	SampType: MSD	TestCod	e: CN_S	Units: mg/Kg		Prep Dat	e:		RunNo: 189	935	
Client ID: DRUMS-SO-10-36	Batch ID: R18935	TestN	o: <b>SW9012B</b>			Analysis Dat	te: <b>2/18/20</b>	15	SeqNo: 25	1083	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	1.04	0.100	0.1000	1.006	32.5	80	120	1.076	3.59	20	SMC
Sample ID: R18935CCV	SampType: CCV	TestCod	e: CN_S	Units: mg/Kg		Prep Dat	e:		RunNo: 189	935	
Client ID: CCV	Batch ID: R18935	TestN	o: <b>SW9012B</b>			Analysis Dat	te: <b>2/18/20</b>	15	SeqNo: 25	1084	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	0.381	0.0200	0.3500	0	109	90	110				

RSD is greater than RSDlimit

Holding times for preparation or analysis exceeded

Η

WO#: **1502126** 

25-Feb-15

# **Specialty Analytical**

Client:	Maul Foster & Alongi
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Project:	Siltronic ID	W / 8128.01.08/08						TestCode: 1	HG_CT	
Sample ID: Client ID:	MB-8944 PBW	SampType: MBLK Batch ID: 8944		e: <b>HG_CT</b> o: <b>E7470A</b>	Units: <b>mg/L</b> <b>E245.1</b>		Prep Date:	2/17/2015 2/17/2015	RunNo: <b>18910</b> SeqNo: <b>250577</b>	
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit I	HighLimit RPD Ref Val	%RPD RPDLimit	Qual
Mercury, To	CLP	ND	0.000100							
Sample ID:	LCS-8944	SampType: <b>LCS</b>	TestCode	e: <b>HG_CT</b>	Units: mg/L		Prep Date:	2/17/2015	RunNo: <b>18910</b>	
Client ID:	LCSW	Batch ID: <b>8944</b>	TestNo	o: <b>E7470A</b>	E245.1		Analysis Date:	2/17/2015	SeqNo: <b>250578</b>	
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit I	HighLimit RPD Ref Val	%RPD RPDLimit	Qual
Mercury, To	CLP	0.00379	0.000100	0.004000	0	94.7	85.4	116		
Sample ID:	1502126-002BMS	SampType: MS	TestCode	e: <b>HG_CT</b>	Units: mg/L		Prep Date:	2/17/2015	RunNo: <b>18910</b>	
Client ID:	DRUMS-AK-SO-0-10	Batch ID: <b>8944</b>	TestNo	o: <b>E7470A</b>	E245.1		Analysis Date:	2/17/2015	SeqNo: <b>250584</b>	
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit I	HighLimit RPD Ref Val	%RPD RPDLimit	Qual
Mercury, To	CLP	0.00407	0.000100	0.004000	0	102	69.5	125		
Sample ID:	1502126-002BMSD	SampType: MSD	TestCode	e: <b>HG_CT</b>	Units: mg/L		Prep Date:	2/17/2015	RunNo: <b>18910</b>	
Client ID:	DDIIMS-VK-SO-0-10	Ratch ID: 8044	TectNi	o. E7/70A	E245 1		Analysis Date	2/17/2015	SeaNo: 250585	

Sample ID: 1502126-002BMSD	SampType: MSD	TestCoo	de: <b>HG_CT</b>	Units: mg/L		Prep Da	te: <b>2/17/20</b>	15	RunNo: <b>189</b>	10	
Client ID: DRUMS-AK-SO-0-10	Batch ID: 8944	TestN	lo: <b>E7470A</b>	E245.1		Analysis Da	te: <b>2/17/20</b>	15	SeqNo: <b>250</b>	585	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury, TCLP	0.00382	0.000100	0.004000	0	95.5	69.5	125	0.004069	6.31	20	

Qualifiers: B Analyte detected in the associated Method Blank

R RPD outside accepted recovery limits

Η

Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

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O RSD is greater than RSDlimit

WO#:

1502126

25-Feb-15

**Specialty Analytical** 

**Client:** 

Maul Foster & Alongi

Siltronic IDW / 8128.01.08/08 TestCode: HG\_CT **Project:** 

Sample ID: CCV	SampType: CCV		de: <b>HG_CT</b>	Units: mg/L		Prep Da			RunNo: 189		
Client ID: CCV	Batch ID: 8944		lo: <b>E7470A</b>	E245.1		Analysis Da			SeqNo: <b>250</b>		
Analyte  Mercury, TCLP	0.00371	0.000100	0.004000	SPK Ref Val	%REC 92.8	LowLimit 90	HighLimit 110	RPD Ref Val	%RPD	RPDLimit	Qual

Η

Holding times for preparation or analysis exceeded

WO#:

SeqNo: 250544

%RPD

**RPDLimit** 

1502126

25-Feb-15

Specialty	<sup>7</sup> Analytical
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Maul Foster & Alongi

**Client:** 

Client ID: LCSS

Analyte Diesel

Lube Oil

Project: Sil	ltronic IDW / 8128.01.08/08		Test	Code: NWTPHDX_S
Sample ID: CCV	SampType: CCV	TestCode: NWTPHDX_S Units: mg/Kg	Prep Date:	RunNo: <b>18906</b>
Client ID: CCV	Batch ID: 8931	TestNo: <b>NWTPH-Dx SW3545A</b>	Analysis Date: 2/16/2015	SeqNo: <b>250542</b>
Analyte	Result	PQL SPK value SPK Ref Val	%REC LowLimit HighLimit RF	PD Ref Val %RPD RPDLimit Qual
Diesel	1400	15.0 1332 0	105 85 115	
Lube Oil	731	50.0 666.0 0	110 85 115	
Sample ID: MB-8931	SampType: <b>MBLK</b>	TestCode: NWTPHDX_S Units: mg/Kg	Prep Date: <b>2/16/2015</b>	RunNo: <b>18906</b>
Client ID: PBS	Batch ID: 8931	TestNo: <b>NWTPH-Dx SW3545A</b>	Analysis Date: 2/16/2015	SeqNo: <b>250543</b>
Analyte	Result	PQL SPK value SPK Ref Val	%REC LowLimit HighLimit RF	PD Ref Val %RPD RPDLimit Qual
Diesel	ND	15.0		
Lube Oil	ND	50.0		
Surr: o-Terphenyl	28.9	33.33	86.6 50 150	
Sample ID: LCS-8931	SampType: <b>LCS</b>	TestCode: NWTPHDX_S Units: mg/Kg	Prep Date: <b>2/16/2015</b>	RunNo: <b>18906</b>

Sample ID: CCV Client ID: CCV	SampType: CCV Batch ID: 8931	TestCode: NWTPHDX_S Units: mg/Kg TestNo: NWTPH-Dx SW3545A	Prep Date: Analysis Date: 2/17/2015	RunNo: <b>18906</b> SeqNo: <b>250546</b>
Analyte	Result	PQL SPK value SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual

SW3545A

0

0

Holding times for preparation or analysis exceeded

%REC

95.3

76.7

SPK value SPK Ref Val

166.7

166.7

TestNo: NWTPH-Dx

Η

**PQL** 

15.0

50.0

Analyte detected in the associated Method Blank Qualifiers:

Batch ID: 8931

Result

159

128

Not Detected at the Reporting Limit

Spike Recovery outside accepted recove

Analysis Date: 2/16/2015

HighLimit RPD Ref Val

125

127

LowLimit

76.3

69.9

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Qual

RSD is greater than RSDlimit

RPD outside accepted recovery limits

WO#:

1502126

25-Feb-15

Client:	Maul Foster & Alongi

**Specialty Analytical** 

Project:	Siltronic IDW / 8128.01.08/08				TestCode:	NWTPHDX_S	
Sample ID: CCV	SampType: CCV	TestCode: NWTPHDX_S Units: mg/Kg		Prep Date:		RunNo: <b>18906</b>	
Client ID: CCV	Batch ID: <b>8931</b>	TestNo: <b>NWTPH-Dx SW3545A</b>		Analysis Date: 2	/17/2015	SeqNo: <b>250546</b>	
Analyte	Result	PQL SPK value SPK Ref Val	%REC	LowLimit High	Limit RPD Ref Val	%RPD RPDLimit	Qual
Diesel	1050	15.0 999.0 0	105	85	115		
Lube Oil	529	50.0 499.5 0	106	85	115		
Sample ID: CCB	SampType: CCB	TestCode: NWTPHDX_S Units: mg/Kg		Prep Date:		RunNo: <b>18906</b>	
Client ID: CCB	Batch ID: 8931	TestNo: <b>NWTPH-Dx SW3545A</b>		Analysis Date: 2	/17/2015	SeqNo: <b>250547</b>	
Analyte	Result	PQL SPK value SPK Ref Val	%REC	LowLimit High	Limit RPD Ref Val	%RPD RPDLimit	Qual
Diesel	ND	15.0					
Lube Oil	ND	50.0					
Surr: o-Terpheny	1 28.5	33.30	85.5	50	150		
Sample ID: <b>15021</b>	31-001ADUP SampType: DUP	TestCode: NWTPHDX_S Units: mg/Kg-dr	ry	Prep Date: 2	/16/2015	RunNo: <b>18906</b>	
Client ID: ZZZZ	ZZ Batch ID: 8931	TestNo: <b>NWTPH-Dx SW3545A</b>		Analysis Date: 2	/17/2015	SeqNo: <b>250551</b>	
Analyte	Result	PQL SPK value SPK Ref Val	%REC	LowLimit High	Limit RPD Ref Val	%RPD RPDLimit	Qual
Diesel	1160	20.9			878.4	27.7 20	RA1
Lube Oil	334	69.5			229.1	37.3 20	RA2
Sample ID: CCV	SampType: CCV	TestCode: NWTPHDX_S Units: mg/Kg		Prep Date:		RunNo: <b>18906</b>	
Client ID: CCV	Batch ID: 8931	TestNo: <b>NWTPH-Dx SW3545A</b>		Analysis Date: 2	/17/2015	SeqNo: <b>250556</b>	
Analyte	Result	PQL SPK value SPK Ref Val	%REC	LowLimit High	Limit RPD Ref Val	%RPD RPDLimit	Qual

Analyte detected in the associated Method Blank Qualifiers:

RPD outside accepted recovery limits

Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

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Η

RSD is greater than RSDlimit

WO#:

1502126

25-Feb-15

**Specialty Analytical** 

Maul Foster & Alongi **Client:** 

**Project:** Siltronic IDW / 8128.01.08/08 TestCode: NWTPHDX\_S

Sample ID: CCV Client ID: CCV	SampType: CCV Batch ID: 8931		le: NWTPHDX	S Units: mg/Kg SW3545A		Prep Dat Analysis Dat	te: te: <b>2/17/2015</b>	i	RunNo: <b>189</b> SeqNo: <b>250</b>		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit F	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Lube Oil	1430 732	15.0 50.0	1332 666.0	0	107 110	85 85	115 115				

Η

Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

Spike Recovery outside accepted recove

WO#: 150

1502126

25-Feb-15

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Specialty	Anal	ytical
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Analyte detected in the associated Method Blank

RSD is greater than RSDlimit

Qualifiers:

Client: Project:	Maul Foster & A Siltronic IDW /	· ·					TestCode: NWTPHGX_S							
Sample ID: CCV	' Sa	mpТуре: <b>ССV</b>	TestCod	e: <b>NWTPHGX</b>	(_S Units: mg/K	(g	Prep Dat	e:		RunNo: 18	950			
Client ID: CCV	<i>'</i> E	Batch ID: <b>8937</b>	TestN	o: <b>NWTPH-G</b>	x 5030_G_S		Analysis Dat	e: <b>2/19/20</b>	15	SeqNo: 25	1411			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual		
Gasoline		100	2.50	100.0	0	100	80	120						
Sample ID: MB-	<b>8937</b> Sa	mpType: <b>MBLK</b>	TestCod	e: <b>NWTPHGX</b>	(_S Units: mg/K	(g	Prep Dat	e: <b>2/17/20</b>	15	RunNo: 18	950			
Client ID: PBS	E	Batch ID: 8937	TestN	o: NWTPH-G	x 5030_G_S		Analysis Dat	e: <b>2/19/20</b>	15	SeqNo: 25	1412			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual		
Gasoline		ND	2.50											
Surr: 4-Bromo	fluorobenzene	4.06		5.000		81.2	50	150						
Sample ID: LCS	<b>-8937</b> Sa	mpType: <b>LCS</b>	TestCod	e: <b>NWTPHGX</b>	(_S Units: mg/K	(g	Prep Dat	e: <b>2/17/20</b>	15	RunNo: 18	950			
Client ID: LCS	<b>S</b> E	Batch ID: 8937	TestN	o: NWTPH-G	x 5030_G_S		Analysis Dat	e: <b>2/19/20</b>	15	SeqNo: 25	1413			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual		
Gasoline		58.3	2.50	50.00	0	117	53.5	121						
Sample ID: 1502	2126-001ADUP Sa	mpType: <b>DUP</b>	TestCod	e: NWTPHGX	(_S Units: mg/K	(g-dry	Prep Dat	e: <b>2/17/20</b>	15	RunNo: 189	950			
Client ID: DRU	IMS-SO-10-36	Batch ID: <b>8937</b>	TestN	o: NWTPH-G	x 5030_G_S		Analysis Dat	e: <b>2/19/20</b> °	15	SeqNo: 25	1495			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual		
Gasoline		78.5	3.49						21.34	115	20	RMI		

Holding times for preparation or analysis exceeded

RPD outside accepted recovery limits

Η

WO#:

1502126

25-Feb-15

**Specialty Analytical** 

Maul Foster & Alongi **Client:** 

Siltronic IDW / 8128.01.08/08 TestCode: NWTPHGX\_S **Project:** 

Sample ID: CCV Client ID: CCV	SampType: CCV Batch ID: 8937		e: NWTPHGX o: NWTPH-G	_S Units: mg/Kg x 5030_G_S		Prep Dat Analysis Dat	te: <b>2/20/2015</b>		RunNo: <b>189</b> SeqNo: <b>251</b>		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit RP	PD Ref Val	%RPD	RPDLimit	Qual
Gasoline	136	2 50	125.0	0	109	80	120				

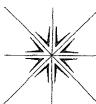
Η

Holding times for preparation or analysis exceeded

- A This sample contains a Gasoline Range Organic not identified as a specific hydrocarbon product. The result was quantified against gasoline calibration standards
- A1 This sample contains a Diesel Range Organic not identified as a specific hydrocarbon product. The result was quantified against diesel calibration standards.
- A2 This sample contains a Lube Oil Range Organic not identified as a specific hydrocarbon product. The result was quantified against a lube oil calibration standard.
- A3 The result was determined to be Non-Detect based on hydrocarbon pattern recognition. The product was carry-over from another hydrocarbon type.
- A4 The product appears to be aged or degraded diesel.
- B The blank exhibited a positive result great than the reporting limit for this compound.
- CN See Case Narrative.
- D Result is based from a dilution.
- E Result exceeds the calibration range for this compound. The result should be considered as estimate.
- F The positive result for this hydrocarbon is due to single component contamination. The product does not match any hydrocarbon in the fuels library.
- G Result may be biased high due to biogenic interferences. Clean up is recommended.
- H Sample was analyzed outside recommended holding time.
- HT At clients request, samples was analyzed outside of recommended holding time.
- J The result for this analyte is between the MDL and the PQL and should be considered as estimated concentration.
- K Diesel result is biased high due to amount of Oil contained in the sample.
- L Diesel result is biased high due to amount of Gasoline contained in the sample.
- M Oil result is biased high due to amount of Diesel contained in the sample.
- MC Sample concentration is greater than 4x the spiked value, the spiked value is considered insignificant.
- MI Result is outside control limits due to matrix interference.
- MSA Value determined by Method of Standard Addition.
- O Laboratory Control Standard (LCS) exceeded laboratory control limits, but meets CCV criteria. Data meets EPA requirements.
- Q Detection levels elevated due to sample matrix.
- R RPD control limits were exceeded.
- RF Duplicate failed due to result being at or near the method-reporting limit.
- RP Matrix spike values exceed established QC limits; post digestion spike is in control.
- S Recovery is outside control limits.
- SC Closing CCV or LCS exceeded high recovery control limits, but associated samples are non-detect. Data meets EPA requirements.
- \* The result for this parameter was greater that the maximum contaminant level of the TCLP regulatory limit.

# **CHAIN OF CUSTODY RECORD**

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# Specialty Analytical

Collected B Signature_ Printed_	11 CC PI	pecialty A 1711 SE Capps Roa clackamas, OR 9701 hone: 503-607-133 ax: 503-607-1336	d 5	ical				Co Ad — Pr Pr	mpa dres none oject	s d	Ma 100 i 100 i 100 i 100 i 100 i	Ni 1 lar 5 4 3.00	14-108 0R	Ste 9** OR 21:3/08	39 P WA	¥ 7	Alongia Alongia Lue Suite ROT Fax 97 ct Name Silty Other	200 1-544-2 onic I	NHO DW
Signature Printed  Turn Around  Rush Analys	nce		No. of Containers	8260 Tri 10 Martin C		PCBS	PH-QX	Anal XX Hd	OTAL CYANIDE SE	PA-P				For L Lab Job No. Shipped Via Air Bill No. Temperature On Re Specialty Analytica Specialty Analytica	eceipt 5	°C			
Date 2/11/15 2/11/15	Time 11:15 12:00	Samp DRUMS-SO- DRUMS-AK- CAPAIPOSH	-10-34		Matrix SoiL SoiL	34	X	/ ) / >	X	×	× ×	× ×	х Х				comme Maded Per Kel	ints 2/13/15	Lab I.D.
	MFA nimed, Sami	ples Will Be Disposed of lays subject to storage fee	60 Days Afte	Time \305 er Receipt.	Received Company		Va.				2		Com	pany:		12	Bupper	Date Z / 11/15 Date	Time 13 5 3 Time 1353



11711 SE Capps Road, Ste B Clackamas, Oregon 97015 TEL: 503-607-1331 FAX: 503-607-1336 Website: www.specialtyanalytical.com

February 20, 2015

James Peale Maul Foster & Alongi 400 E. Mill Plain Blvd. Suite 400 Vancouver, WA 98660

TEL: (360) 694-2691 FAX (360) 906-1958

RE: Siltronic / 8128.01.08/08

Dear James Peale: Order No.: 1502131

Specialty Analytical received 1 sample(s) on 2/13/2015 for the analyses presented in the following report.

There were no problems with the analysis and all data for associated QC met EPA or laboratory specifications, except where noted in the Case Narrative, or as qualified with flags. Results apply only to the samples analyzed. Without approval of the laboratory, the reproduction of this report is only permitted in its entirety.

If you have any questions regarding these tests, please feel free to call.

Sincerely,

Marty French

Lab Director

CLIENT: Maul Foster & Alongi Collection Date: 2/12/2015 1:50:00 PM

**Date Reported:** 

Matrix: SOIL

20-Feb-15

**Project:** Siltronic / 8128.01.08/08

Analyses	Result	RL	Qual	Unit	DF	Date Analyzed
NWTPH-DX		NWTPH-DX				Analyst: <b>BS</b>
Diesel	878	20.9	A1	mg/Kg-dry	1	2/17/2015 10:22:09 AM
Lube Oil	229	69.5	A2	mg/Kg-dry	1	2/17/2015 10:22:09 AM
Surr: o-Terphenyl	51.5	50-150		%REC	1	2/17/2015 10:22:09 AM
NWTPH-GX		NWTPH-GX				Analyst: BS
Gasoline	426	3.48		mg/Kg-dry	1	2/19/2015 2:29:03 PM
Surr: 4-Bromofluorobenzene	64.4	50-150		%REC	1	2/19/2015 2:29:03 PM
TCLP 8 ICP/MS METALS-TCLP LEAC	HED	E1311/6020				Analyst: <b>KP</b>
Arsenic, TCLP	ND	6.95		μg/L	1	2/19/2015 5:27:00 PM
Barium, TCLP	646	69.5		μg/L	1	2/19/2015 5:27:00 PM
Cadmium, TCLP	ND	6.95		μg/L	1	2/19/2015 5:27:00 PM
Chromium, TCLP	9.32	6.95		μg/L	1	2/19/2015 5:27:00 PM
Lead, TCLP	10.0	6.95		μg/L	1	2/19/2015 5:27:00 PM
Selenium, TCLP	ND	69.5		μg/L	1	2/19/2015 5:27:00 PM
Silver, TCLP	ND	6.95		μg/L	1	2/19/2015 5:27:00 PM
TCLP 8 TOTAL MERCURY		E7470A				Analyst: <b>BW</b>
Mercury, TCLP	ND	0.000100		mg/L	1	2/17/2015 3:10:09 PM
SEMIVOLATILE ORGANICS-LOW LE	VEL	SW8270D				Analyst: bda
1,2,4-Trichlorobenzene	ND	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
1,2-Dichlorobenzene	ND	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
1,2-Diphenylhydrazine	ND	167		μg/Kg	1	2/18/2015 2:28:00 PM
1,3-Dichlorobenzene	ND	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
1,4-Dichlorobenzene	ND	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
1-Methylnaphthalene	6460	133		μg/Kg	4	2/18/2015 2:00:00 PM
2,4,5-Trichlorophenol	ND	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
2,4,6-Trichlorophenol	ND	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
2,4-Dichlorophenol	ND	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
2,4-Dimethylphenol	ND	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
2,4-Dinitrophenol	ND	333		μg/Kg	1	2/18/2015 2:28:00 PM
2,4-Dinitrotoluene	ND	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
2,6-Dinitrotoluene	ND	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
2-Chloronaphthalene	ND	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
2-Chlorophenol	ND	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
2-Methylnaphthalene	13400	333		μg/Kg	10	2/18/2015 1:31:00 PM
2-Methylphenol	ND	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
2-Nitroaniline	ND	33.3		μg/Kg	1	2/18/2015 2:28:00 PM

CLIENT: Maul Foster & Alongi Collection Date: 2/12/2015 1:50:00 PM

**Date Reported:** 

Matrix: SOIL

20-Feb-15

**Project:** Siltronic / 8128.01.08/08

Analyses	Result	RL	Qual	Unit	DF	Date Analyzed
SEMIVOLATILE ORGANICS-LOW LI	EVEL	SW8270D				Analyst: <b>bda</b>
2-Nitrophenol	ND	167		μg/Kg	1	2/18/2015 2:28:00 PM
3-&4-Methylphenol	ND	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
3,3-Dichlorobenzidine	ND	167		μg/Kg	1	2/18/2015 2:28:00 PM
3-Nitroaniline	ND	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
4,6-Dinitro-2-methylphenol	ND	167		μg/Kg	1	2/18/2015 2:28:00 PM
4-Bromophenyl phenyl ether	ND	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
4-Chloro-3-methylphenol	ND	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
4-Chloroaniline	ND	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
4-Chlorophenyl phenyl ether	ND	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
4-Nitroaniline	ND	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
4-Nitrophenol	ND	167		μg/Kg	1	2/18/2015 2:28:00 PM
Acenaphthene	10700	333		μg/Kg	10	2/18/2015 1:31:00 PM
Acenaphthylene	536	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
Aniline	ND	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
Anthracene	4530	133		μg/Kg	4	2/18/2015 2:00:00 PM
Benz(a)anthracene	2550	133		μg/Kg	4	2/18/2015 2:00:00 PM
Benzidine	ND	167		μg/Kg	1	2/18/2015 2:28:00 PM
Benzo(a)pyrene	3030	133		μg/Kg	4	2/18/2015 2:00:00 PM
Benzo(b)fluoranthene	2570	133		μg/Kg	4	2/18/2015 2:00:00 PM
Benzo(g,h,i)perylene	2130	133		μg/Kg	4	2/18/2015 2:00:00 PM
Benzo(k)fluoranthene	620	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
Benzoic Acid	ND	667		μg/Kg	1	2/18/2015 2:28:00 PM
Benzyl Alcohol	ND	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
Benzyl butyl phthalate	ND	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
Bis(2-chloroethoxy)methane	ND	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
Bis(2-chloroethyl)ether	ND	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
Bis(2-chloroisopropyl)ether	ND	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
Bis(2-ethylhexyl)phthalate	72.7	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
Carbazole	1890	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
Chrysene	2690	133		μg/Kg	4	2/18/2015 2:00:00 PM
Dibenz(a,h)anthracene	436	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
Dibenzofuran	852	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
Diethyl phthalate	ND	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
Dimethyl phthalate	ND	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
Di-n-butyl phthalate	ND	50.0		μg/Kg	1	2/18/2015 2:28:00 PM
Di-n-octyl phthalate	ND	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
Fluoranthene	8030	133		μg/Kg	4	2/18/2015 2:00:00 PM
Fluorene	5270	133		μg/Kg	4	2/18/2015 2:00:00 PM
Hexachlorobenzene	ND	33.3		μg/Kg	1	2/18/2015 2:28:00 PM

CLIENT: Maul Foster & Alongi Collection Date: 2/12/2015 1:50:00 PM

**Date Reported:** 

Matrix: SOIL

20-Feb-15

**Project:** Siltronic / 8128.01.08/08

•						
Analyses	Result	RL	Qual	Unit	DF	Date Analyzed
SEMIVOLATILE ORGANICS-LOW LE	VEL	SW8270D				Analyst: <b>bda</b>
Hexachlorobutadiene	ND	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
Hexachlorocyclopentadiene	ND	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
Hexachloroethane	ND	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
Indeno(1,2,3-cd)pyrene	1530	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
Isophorone	ND	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
Naphthalene	64300	3330		μg/Kg	100	2/18/2015 1:02:00 PM
Nitrobenzene	ND	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
N-Nitrosodimethylamine	ND	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
N-Nitrosodi-n-propylamine	ND	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
N-Nitrosodiphenylamine	ND	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
Pentachlorophenol	ND	50.0		μg/Kg	1	2/18/2015 2:28:00 PM
Phenanthrene	21800	333		μg/Kg	10	2/18/2015 1:31:00 PM
Phenol	ND	33.3		μg/Kg	1	2/18/2015 2:28:00 PM
Pyrene	8710	133		μg/Kg	4	2/18/2015 2:00:00 PM
Pyridine	ND	167		μg/Kg	1	2/18/2015 2:28:00 PM
Surr: 2,4,6-Tribromophenol	56.2	57.8-119	SMI	%REC	1	2/18/2015 2:28:00 PM
Surr: 2-Fluorobiphenyl	65.4	52.6-93.2		%REC	4	2/18/2015 2:00:00 PM
Surr: 2-Fluorophenol	104	40.7-111		%REC	4	2/18/2015 2:00:00 PM
Surr: 4-Terphenyl-d14	100	49.8-118		%REC	4	2/18/2015 2:00:00 PM
Surr: Nitrobenzene-d5	79.2	44.8-103		%REC	4	2/18/2015 2:00:00 PM
Surr: Phenol-d6	107	47.5-117		%REC	4	2/18/2015 2:00:00 PM
VOLATILE ORGANICS BY GC/MS		SW8260B				Analyst: <b>CK</b>
1,1,1,2-Tetrachloroethane	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
1,1,1-Trichloroethane	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
1,1,2,2-Tetrachloroethane	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
1,1,2-Trichloroethane	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
1,1-Dichloroethane	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
1,1-Dichloroethene	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
1,1-Dichloropropene	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
1,2,3-Trichlorobenzene	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
1,2,3-Trichloropropane	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
1,2,4-Trichlorobenzene	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
1,2,4-Trimethylbenzene	4620	1000		μg/Kg	100	2/17/2015 2:27:00 PM
1,2-Dibromo-3-chloropropane	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
1,2-Dibromoethane	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
1,2-Dichlorobenzene	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
1,2-Dichloroethane	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM

CLIENT: Maul Foster & Alongi Collection Date: 2/12/2015 1:50:00 PM

**Date Reported:** 

Matrix: SOIL

20-Feb-15

**Project:** Siltronic / 8128.01.08/08

Analyses	Result	RL	Qual	Unit	DF	Date Analyzed
VOLATILE ORGANICS BY GC/MS		SW8260B				Analyst: <b>CK</b>
1,2-Dichloropropane	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
1,3,5-Trimethylbenzene	1550	1000		μg/Kg	100	2/17/2015 2:27:00 PM
1,3-Dichlorobenzene	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
1,3-Dichloropropane	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
1,4-Dichlorobenzene	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
2,2-Dichloropropane	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
2-Butanone	ND	20.0		μg/Kg	1	2/17/2015 3:32:00 PM
2-Chlorotoluene	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
2-Hexanone	ND	20.0		μg/Kg	1	2/17/2015 3:32:00 PM
4-Chlorotoluene	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
4-Isopropyltoluene	120	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
4-Methyl-2-pentanone	ND	20.0		μg/Kg	1	2/17/2015 3:32:00 PM
Acetone	ND	50.0		μg/Kg	1	2/17/2015 3:32:00 PM
Benzene	1820	1000		μg/Kg	100	2/17/2015 2:27:00 PM
Bromobenzene	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
Bromochloromethane	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
Bromodichloromethane	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
Bromoform	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
Bromomethane	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
Carbon disulfide	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
Carbon tetrachloride	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
Chlorobenzene	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
Chloroethane	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
Chloroform	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
Chloromethane	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
cis-1,2-Dichloroethene	44.1	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
cis-1,3-Dichloropropene	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
Dibromochloromethane	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
Dibromomethane	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
Dichlorodifluoromethane	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
Ethylbenzene	5240	1000		μg/Kg	100	2/17/2015 2:27:00 PM
Hexachlorobutadiene	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
Isopropylbenzene	213	100		μg/Kg	10	2/17/2015 3:00:00 PM
m,p-Xylene	4940	2000		μg/Kg	100	2/17/2015 2:27:00 PM
Methyl tert-butyl ether	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
Methylene chloride	ND	50.0		μg/Kg	1	2/17/2015 3:32:00 PM
Naphthalene	451000	100000		μg/Kg	10000	2/17/2015 1:23:00 PM
n-Butylbenzene	34.3	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
n-Propylbenzene	105	10.0		μg/Kg	1	2/17/2015 3:32:00 PM

CLIENT: Maul Foster & Alongi Collection Date: 2/12/2015 1:50:00 PM

**Date Reported:** 

Matrix: SOIL

20-Feb-15

**Project:** Siltronic / 8128.01.08/08

Analyses	Result	RL	Qual	Unit	DF	Date Analyzed
VOLATILE ORGANICS BY GC/MS	;	SW8260B				Analyst: <b>CK</b>
o-Xylene	2360	1000		μg/Kg	100	2/17/2015 2:27:00 PM
sec-Butylbenzene	13.1	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
Styrene	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
tert-Butylbenzene	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
Tetrachloroethene	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
Toluene	197	100		μg/Kg	10	2/17/2015 3:00:00 PM
trans-1,2-Dichloroethene	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
trans-1,3-Dichloropropene	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
Trichloroethene	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
Trichlorofluoromethane	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
Vinyl chloride	ND	10.0		μg/Kg	1	2/17/2015 3:32:00 PM
Surr: 1,2-Dichloroethane-d4	107	71.5-112		%REC	1	2/17/2015 3:32:00 PM
Surr: 4-Bromofluorobenzene	95.8	75.7-122		%REC	1	2/17/2015 3:32:00 PM
Surr: Dibromofluoromethane	97.9	64.3-124		%REC	1	2/17/2015 3:32:00 PM
Surr: Toluene-d8	112	74.9-120		%REC	1	2/17/2015 3:32:00 PM
CYANIDE	;	SW9012B				Analyst: <b>EFH</b>
Cyanide, Total	0.423	0.0200		mg/Kg	1	2/18/2015 11:22:45 AM

WO#:

1502131

20-Feb-15

**Specialty Analytical** 

**Client:** 

Maul Foster & Alongi

**Project:** Siltronic / 8128.01.08/08 **TestCode: 6020\_TCLP** 

Sample ID: ICV Client ID: ICV	SampType: ICV Batch ID: 8938		TestCode: 6020_TCLP Units: μg/L TestNo: E1311/6020 SW3010A			Prep Da Analysis Da		15	RunNo: <b>18928</b> SegNo: <b>251085</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit		%RPD	RPDLimit	Qual	
Arsenic, TCLP	49.6	0.100	50.00	0	99.1	90	110					
Barium, TCLP	47.9	1.00	50.00	0	95.7	90	110					
Cadmium, TCLP	47.9	0.100	50.00	0	95.8	90	110					
Chromium, TCLP	50.2	0.100	50.00	0	100	90	110					
Lead, TCLP	47.8	0.100	50.00	0	95.6	90	110					
Selenium, TCLP	52.1	1.00	50.00	0	104	90	110					
Silver, TCLP	47.8	0.100	50.00	0	95.6	90	110					

Sample ID: CCV	SampType: CCV	TestCod	TestCode: 6020_TCLP Units: µg/L			Prep Da	te:		RunNo: <b>18928</b>			
Client ID: CCV	Batch ID: 8938	TestN	No: <b>E1311/602</b> 0	0 SW3010A		Analysis Da	te: <b>2/18/20</b>	15	5 SeqNo: <b>251087</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Arsenic, TCLP	48.7	0.100	50.00	0	97.5	90	110					
Barium, TCLP	48.9	1.00	50.00	0	97.8	90	110					
Cadmium, TCLP	50.0	0.100	50.00	0	100	90	110					
Chromium, TCLP	49.9	0.100	50.00	0	99.7	90	110					
Lead, TCLP	49.9	0.100	50.00	0	99.7	90	110					
Selenium, TCLP	47.5	1.00	50.00	0	95.0	90	110					
Silver, TCLP	50.1	0.100	50.00	0	100	90	110					

Qualifiers: B Analyte detected in the associated Method Blank

R RPD outside accepted recovery limits

Η

Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

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O RSD is greater than RSDlimit

S Spike Recovery outside accepted recovery

WO#:

1502131

20-Feb-15

**Specialty Analytical** 

Maul Foster & Alongi **Client:** 

**Project:** Siltronic / 8128.01.08/08 TestCode: 6020\_TCLP

Sample ID: MB-8938 Client ID: PBW	SampType: MBLK  Batch ID: 8938		e: <b>6020_TCL</b> o: <b>E1311/602</b>		Prep Date: <b>2/17/2</b> Analysis Date: <b>2/18/</b> 2				RunNo: <b>189</b> SeqNo: <b>25</b> 1		
CHOIR ID.	Baton IB. Coo	10011	0. 21011/002	0 01100107		7 il lalyolo Da	2,10,20		004110. 20	.000	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	ND	0.100									
Barium, TCLP	ND	1.00									
Cadmium, TCLP	ND	0.100									
Chromium, TCLP	ND	0.100									
Lead, TCLP	ND	0.100									
Selenium, TCLP	ND	1.00									
Silver, TCLP	ND	0.100									

Sample ID: LCS-8938	SampType: LCS	TestCod	de: <b>6020_TCL</b>	P Units: μg/L		Prep Da	te: <b>2/17/20</b>	15	RunNo: 189	)28	
Client ID: LCSW	Batch ID: 8938	TestN	lo: <b>E1311/602</b>	0 SW3010A		Analysis Da	te: <b>2/18/20</b>	15	SeqNo: <b>251</b>	090	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	45.8	0.100	50.00	0	91.6	80	120				
Barium, TCLP	50.5	1.00	50.00	0	101	80	120				
Cadmium, TCLP	50.3	0.100	50.00	0	101	80	120				
Chromium, TCLP	46.5	0.100	50.00	0	93.1	80	120				
Lead, TCLP	50.3	0.100	50.00	0	101	80	120				
Selenium, TCLP	44.5	1.00	50.00	0	88.9	80	120				
Silver, TCLP	51.0	0.100	50.00	0	102	80	120				

Qualifiers: Analyte detected in the associated Method Blank

Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

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WO#:

1502131

20-Feb-15

**Specialty Analytical** 

Maul Foster & Alongi **Client:** 

**Project:** Siltronic / 8128.01.08/08 TestCode: 6020\_TCLP

Sample ID: A1502141-001BDUP Client ID: ZZZZZZ	SampType: <b>DUP</b> Batch ID: <b>8938</b>		le: <b>6020_TCL</b> lo: <b>E1311/602</b>			Prep Da Analysis Da	te: <b>2/17/20</b>		RunNo: <b>189</b> SeqNo: <b>251</b>		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	30.4	0.100						30.72	1.15	20	
Barium, TCLP	23.6	1.00						32.63	32.2	20	R
Cadmium, TCLP	ND	0.100						0	0	20	
Chromium, TCLP	ND	0.100						0.1058	200	20	RF
Lead, TCLP	0.115	0.100						0.1273	10.4	20	
Selenium, TCLP	ND	1.00						0	0	20	
Silver, TCLP	ND	0.100						0	0	20	

Sample ID: ICV	SampType: ICV	TestCo	de: <b>6020_TCLI</b>	P Units: μg/L		Prep Da	te:		RunNo: 189	928	
Client ID: ICV	Batch ID: 8938	TestN	No: <b>E1311/602</b> 0	0 SW3010A		Analysis Da	te: <b>2/19/20</b>	15	SeqNo: <b>25</b> 1	1363	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	49.1	0.100	50.00	0	98.1	90	110				
Barium, TCLP	48.5	1.00	50.00	0	97.1	90	110				
Cadmium, TCLP	48.5	0.100	50.00	0	97.0	90	110				
Chromium, TCLP	47.8	0.100	50.00	0	95.7	90	110				
Lead, TCLP	47.5	0.100	50.00	0	95.0	90	110				
Selenium, TCLP	49.1	1.00	50.00	0	98.2	90	110				
Silver, TCLP	47.0	0.100	50.00	0	94.0	90	110				

Qualifiers: Analyte detected in the associated Method Blank

Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

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WO#: **1502131** 

20-Feb-15

# **Specialty Analytical**

Client: Maul Foster & Alongi

**Project:** Siltronic / 8128.01.08/08 **TestCode: 6020\_TCLP** 

Sample ID: A1502141-001BMS Client ID: ZZZZZZ	SampType: MS Batch ID: 8938		de: 6020_TCLI lo: E1311/602			Prep Da Analysis Da	te: <b>2/17/20</b>		RunNo: <b>189</b> SeqNo: <b>251</b>		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	78.2	0.100	50.00	30.72	94.9	70	130				
Barium, TCLP	70.7	1.00	50.00	32.63	76.2	70	130				
Cadmium, TCLP	48.7	0.100	50.00	0.01392	97.4	70	130				
Chromium, TCLP	44.7	0.100	50.00	0.1058	89.2	70	130				
Lead, TCLP	48.8	0.100	50.00	0.1273	97.3	70	130				
Selenium, TCLP	44.4	1.00	50.00	0	88.8	70	130				
Silver, TCLP	47.3	0.100	50.00	0	94.7	70	130				

Sample ID: <b>A1502141-001BMSD</b>	SampType: MSD	TestCoo	de: <b>6020_TCL</b> I	P Units: μg/L		Prep Da	te: <b>2/17/20</b>	15	RunNo: 189	928	
Client ID: ZZZZZZ	Batch ID: <b>8938</b>	TestN	lo: <b>E1311/602</b>	0 SW3010A		Analysis Da	te: <b>2/19/20</b>	15	SeqNo: <b>251</b>	1369	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	76.7	0.100	50.00	30.72	92.0	70	130	78.16	1.86	20	•
Barium, TCLP	68.5	1.00	50.00	32.63	71.8	70	130	70.72	3.17	20	
Cadmium, TCLP	48.1	0.100	50.00	0.01392	96.3	70	130	48.71	1.18	20	
Chromium, TCLP	43.4	0.100	50.00	0.1058	86.6	70	130	44.73	3.02	20	
Lead, TCLP	47.2	0.100	50.00	0.1273	94.1	70	130	48.78	3.33	20	
Selenium, TCLP	44.4	1.00	50.00	0	88.8	70	130	44.38	0.0225	20	
Silver, TCLP	46.6	0.100	50.00	0	93.2	70	130	47.33	1.58	20	

Qualifiers: B Analyte detected in the associated Method Blank

R RPD outside accepted recovery limits

Η

Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

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WO#:

1502131

20-Feb-15

**Specialty Analytical** 

**Client:** 

Maul Foster & Alongi

**Project:** Siltronic / 8128.01.08/08 **TestCode: 6020\_TCLP** 

Sample ID: CCV	SampType: CCV		de: <b>6020_TCL</b> I			Prep Da			RunNo: 189		
Client ID: CCV	Batch ID: <b>8938</b>	TestN	lo: <b>E1311/602</b>	0 SW3010A		Analysis Da	te: <b>2/19/20</b>	15	SeqNo: <b>25</b> 1	1373	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	48.4	0.100	50.00	0	96.7	90	110				
Barium, TCLP	49.5	1.00	50.00	0	99.1	90	110				
Cadmium, TCLP	49.4	0.100	50.00	0	98.7	90	110				
Chromium, TCLP	46.9	0.100	50.00	0	93.9	90	110				
Lead, TCLP	48.7	0.100	50.00	0	97.4	90	110				
Selenium, TCLP	47.7	1.00	50.00	0	95.4	90	110				
Silver, TCLP	47.9	0.100	50.00	0	95.8	90	110				

Sample ID: CCV	SampType: CCV	TestCod	de: <b>6020_TCLI</b>	P Units: μg/L		Prep Da	te:		RunNo: 189	28	
Client ID: CCV	Batch ID: 8938	TestN	lo: <b>E1311/602</b> 0	SW3010A		Analysis Da	te: <b>2/19/20</b>	15	SeqNo: <b>251</b>	384	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	49.1	0.100	50.00	0	98.2	90	110				
Barium, TCLP	49.8	1.00	50.00	0	99.6	90	110				
Cadmium, TCLP	49.9	0.100	50.00	0	99.7	90	110				
Chromium, TCLP	47.8	0.100	50.00	0	95.7	90	110				
Lead, TCLP	48.6	0.100	50.00	0	97.2	90	110				
Selenium, TCLP	49.6	1.00	50.00	0	99.1	90	110				
Silver, TCLP	48.2	0.100	50.00	0	96.4	90	110				

Qualifiers: B Analyte detected in the associated Method Blank

R RPD outside accepted recovery limits

Η

Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

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O RSD is greater than RSDlimit

S Spike Recovery outside accepted recovery

WO#:

1502131

20-Feb-15

# **Specialty Analytical**

Client:	Maul Foster & Alongi
Droject.	Siltronic / 8128 01 08/0

ักร TestCode: 8260 S

<b>Project:</b> Siltronic / 8	3128.01.08/08						T	SestCode: 8	260_S		
Sample ID: CCV MSVWS-2015	SampType: CCV	TestCod	e: <b>8260_S</b>	Units: µg/Kg		Prep Date	<b>)</b> :		RunNo: 188	395	
Client ID: CCV	Batch ID: 8936	TestN	o: <b>SW8260B</b>	5030		Analysis Date	e: <b>2/16/20</b>	15	SeqNo: <b>250</b>	319	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	77.7	10.0	80.00	0	97.2	80	120		-		
1,2-Dichloropropane	75.7	10.0	80.00	0	94.6	80	120				
Chloroform	79.2	10.0	80.00	0	99.0	80	120				
Ethylbenzene	92.4	10.0	80.00	0	115	80	120				
Toluene	67.8	10.0	80.00	0	84.8	80	120				
Vinyl chloride	76.9	10.0	80.00	0	96.1	80	120				
Sample ID: LCS MSVWS-2016	SampType: <b>LCS</b>	TestCod	e: <b>8260_S</b>	Units: µg/Kg		Prep Date	<b>)</b> :		RunNo: 188	395	
Client ID: LCSS	Batch ID: 8936	TestN	o: <b>SW8260B</b>	5030		Analysis Date	e: <b>2/16/20</b>	15	SeqNo: <b>250</b>	320	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	35.5	10.0	40.00	0	88.8	85.1	136				
Benzene	40.3	10.0	40.00	0	101	87.5	130				
Chlorobenzene	43.1	10.0	40.00	0	108	84.4	130				
Toluene	34.4	10.0	40.00	0	86.1	83.7	127				
Trichloroethene	40.6	10.0	40.00	0	102	88.5	123				
Sample ID: <b>MB</b>	SampType: <b>MBLK</b>	TestCod	e: <b>8260_S</b>	Units: µg/Kg		Prep Date	);		RunNo: 188	395	
Client ID: PBS	Batch ID: 8936	TestN	o: <b>SW8260B</b>	5030		Analysis Date	e: <b>2/16/20</b>	15	SeqNo: <b>250</b>	)321	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	10.0									
	ND	10.0									

Holding times for preparation or analysis exceeded

Qualifiers:

Analyte detected in the associated Method Blank

RPD outside accepted recovery limits

Η

ND Not Detected at the Reporting Limit

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Spike Recovery outside accepted recove

RSD is greater than RSDlimit

WO#:

1502131

20-Feb-15

**Specialty Analytical** 

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/0

Siltronic / 8128.01.08/08 **TestCode: 8260\_S** 

Sample ID: MB	SampType: MBLK	TestCod	e: <b>8260_S</b>	Units: µg/Kg		Prep Da	ite:		RunNo: 188	95	
Client ID: PBS	Batch ID: 8936	TestN	o: <b>SW8260B</b>	5030		Analysis Da	ite: <b>2/16/2</b> 0	15	SeqNo: 250	321	
Analyta	Dooult	DOL	CDK value	SPK Ref Val	%REC	Loudinait	lliabliasit	DDD Def Vel	%RPD	RPDLimit	Ougl
Analyte	Result	PQL	SPK value	SPK Rei Vai	%REC	LowLimit	nignLimit	RPD Ref Val	%RPD	RPDLIMIL	Qual
1,1,2,2-Tetrachloroethane	ND	10.0									
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	10.0									
1,1,2-Trichloroethane	ND	10.0									
1,1-Dichloroethane	ND	10.0									
1,1-Dichloroethene	ND	10.0									
1,1-Dichloropropene	ND	10.0									
1,2,3-Trichlorobenzene	ND	10.0									
1,2,3-Trichloropropane	ND	10.0									
1,2,4-Trichlorobenzene	ND	10.0									
1,2,4-Trimethylbenzene	ND	10.0									
1,2-Dibromo-3-chloropropane	ND	10.0									
1,2-Dibromoethane	ND	10.0									
1,2-Dichlorobenzene	ND	10.0									
1,2-Dichloroethane	ND	10.0									
1,2-Dichloropropane	ND	10.0									
1,3,5-Trimethylbenzene	ND	10.0									
1,3-Dichlorobenzene	ND	10.0									
1,3-Dichloropropane	ND	10.0									
1,4-Dichlorobenzene	ND	10.0									
2,2-Dichloropropane	ND	10.0									
2-Butanone	ND	20.0									
2-Chlorotoluene	ND	10.0									
2-Hexanone	ND	20.0									
4-Chlorotoluene	ND	10.0									
4-Isopropyltoluene	ND	10.0									
4-Methyl-2-pentanone	ND	20.0									

Qualifiers:

Analyte detected in the associated Method Blank

Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

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O RSD is greater than RSDlimit

R RPD outside accepted recovery limits

S Spike Recovery outside accepted recove

WO#:

1502131

20-Feb-15

**Specialty Analytical** 

Maul Foster & Alongi **Client: Project:** 

Siltronic / 8128.01.08/08 TestCode: 8260\_S

Sample ID: MB	SampType: MBLK	TestCode: 8260_S	Units: µg/Kg	Prep Date		RunNo: <b>18895</b>	
Client ID: PBS	Batch ID: <b>8936</b>	TestNo: SW8260B	5030	Analysis Date	: 2/16/2015	SeqNo: <b>250321</b>	
Analyte	Result	PQL SPK value	SPK Ref Val	%REC LowLimit	HighLimit RPD Ref Val	%RPD RPDLimit	Qual
Acetone	ND	50.0					
Benzene	ND	10.0					
Bromobenzene	ND	10.0					
Bromochloromethane	ND	10.0					
Bromodichloromethane	ND	10.0					
Bromoform	ND	10.0					
Bromomethane	ND	10.0					
Carbon disulfide	ND	10.0					
Carbon tetrachloride	ND	10.0					
Chlorobenzene	ND	10.0					
Chloroethane	ND	10.0					
Chloroform	ND	10.0					
Chloromethane	ND	10.0					
cis-1,2-Dichloroethene	ND	10.0					
cis-1,3-Dichloropropene	ND	10.0					
Dibromochloromethane	ND	10.0					
Dibromomethane	ND	10.0					
Dichlorodifluoromethane	ND	10.0					
Ethylbenzene	ND	10.0					
Hexachlorobutadiene	ND	10.0					
Isopropylbenzene	ND	10.0					
m,p-Xylene	ND	20.0					
Methyl tert-butyl ether	ND	10.0					
Methylene chloride	ND	50.0					
Naphthalene	ND	10.0					
n-Butylbenzene	ND	10.0					
Qualifiers: B Analyte dete	ected in the associated Method Bla	nk H Holdi	ng times for preparation	or analysis exceeded	ND Not Detected at the	e Reporting Limit Pa	age 8 of 28

Spike Recovery outside accepted recove

Analyte detected in the associated Method Blank

ND Not Detected at the Reporting Limit

WO#:

1502131

20-Feb-15

**Specialty Analytical** 

Client: Maul Foster & Alongi

<b>Project:</b> Siltronic / S	8128.01.08/08					TestCode	: 8260_S	
Sample ID: MB	SampType: MBLK	TestCode: 8260_S	Units: µg/Kg		Prep Dat	e:	RunNo: 18895	
Client ID: PBS	Batch ID: 8936	TestNo: SW826	OB 5030		Analysis Dat	e: <b>2/16/2015</b>	SeqNo: <b>250321</b>	
Analyte	Result	PQL SPK valu	e SPK Ref Val	%REC	LowLimit	HighLimit RPD Re	f Val %RPD RF	PDLimit Qua
n-Propylbenzene	ND	10.0						
p-Xylene	ND	10.0						
ec-Butylbenzene	ND	10.0						
Styrene	ND	10.0						
ert-Butylbenzene	ND	10.0						
etrachloroethene	ND	10.0						
oluene	ND	10.0						
rans-1,2-Dichloroethene	ND	10.0						
ans-1,3-Dichloropropene	ND	10.0						
richloroethene	ND	10.0						
richlorofluoromethane	ND	10.0						
inyl chloride	ND	10.0						
Surr: 1,2-Dichloroethane-d4	90.8	100	0	90.8	71.5	112		
Surr: 4-Bromofluorobenzene	96.7	100	0	96.7	75.7	122		
Surr: Dibromofluoromethane	94.8	100	0	94.8	64.3	124		
Surr: Toluene-d8	107	100	0	107	74.9	120		
Sample ID: <b>1502116-001AMS</b>	SampType: <b>MS</b>	TestCode: 8260_S	Units: µg/Kg		Prep Dat	e: <b>2/16/2015</b>	RunNo: <b>18895</b>	
Client ID: ZZZZZZ	Batch ID: 8936	TestNo: SW826	OB 5030		Analysis Dat	e: <b>2/16/2015</b>	SeqNo: <b>250325</b>	
nalyte	Result	PQL SPK valu	e SPK Ref Val	%REC	LowLimit	HighLimit RPD Re	f Val %RPD RF	PDLimit Qua
,1-Dichloroethene	42800	10000 4000	0 0	107	46.6	147		
Benzene	42600	10000 4000	0 0	107	65.2	121		
Chlorobenzene	45600	10000 4000	0 0	114	40.9	122		
Qualifiers: B Analyte detec	eted in the associated Method Bl	lank H Ho	ding times for preparation	or analysis	exceeded	ND Not Detecte	ed at the Reporting Limit	Page 9
O RSD is greater than RSDlimit			D outside accepted recove	-			very outside accepted recov	1 age 9

TestCode: 8260\_S

WO#: 15

1502131

20-Feb-15

Specialty	Analytical
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Client:	Maul Foster & Alongi
Project:	Siltronic / 8128.01.08/08

Sample ID: 1502116-001AMS Client ID: ZZZZZZ	SampType: MS Batch ID: 8936		tCode: <b>8260_S</b> Units: <b>µg/Kg</b> estNo: <b>SW8260B 5030</b>		Prep Date: <b>2/16/2015</b> Analysis Date: <b>2/16/2015</b>				RunNo: <b>188</b> SeqNo: <b>250</b>		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Toluene Trichloroethene	47000 44300	10000 10000	40000 40000	5600 0	103 111	52.1 57.6	127 122				

Sample ID: 1502116-001AMSD	SampType: MSD	TestCoo	de: <b>8260_S</b>	Units: µg/Kg		Prep Dat	te: <b>2/16/20</b>	15	RunNo: <b>188</b>	95	
Client ID: ZZZZZZ	Batch ID: 8936	TestN	lo: <b>SW8260B</b>	5030		Analysis Dat	te: <b>2/16/20</b>	15	SeqNo: <b>250</b>	326	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	49600	10000	40000	0	124	46.6	147	42790	14.6	30	
Benzene	42500	10000	40000	0	106	65.2	121	42610	0.235	30	
Chlorobenzene	43000	10000	40000	0	108	40.9	122	45570	5.69	30	
Toluene	48000	10000	40000	5600	106	52.1	127	46970	2.11	30	
Trichloroethene	45500	10000	40000	0	114	57.6	122	44330	2.67	30	

Sample ID: CCV MSVWS-2015	SampType: CCV	TestCoo	le: <b>8260_S</b>	Units: µg/Kg		Prep Da	te:		RunNo: 188	395	
Client ID: CCV	Batch ID: 8936	TestN	lo: <b>SW8260B</b>	5030		Analysis Da	te: <b>2/17/20</b>	15	SeqNo: <b>250</b>	786	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	39.8	10.0	40.00	0	99.4	80	120				
1,2-Dichloropropane	41.2	10.0	40.00	0	103	80	120				
Chloroform	44.0	10.0	40.00	0	110	80	120				
Ethylbenzene	44.6	10.0	40.00	0	112	80	120				
Toluene	33.9	10.0	40.00	0	84.6	80	120				
Vinyl chloride	34.1	10.0	40.00	0	85.3	80	120				

Qualifiers: B Analyte detected in the associated Method Blank

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

Spike Recovery outside accepted recove

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O RSD is greater than RSDlimit

R RPD outside accepted recovery limits

WO#:

1502131

20-Feb-15

**Specialty Analytical** 

**Client:** 

Maul Foster & Alongi

Siltronic / 8128.01.08/08 TestCode: 8260 S **Project:** 

Sample ID: CCV MSVWS-2015 SampType: CCV TestCode: 8260\_S Units: µg/Kg Prep Date: RunNo: 18895

CCV Client ID: Batch ID: 8936 TestNo: SW8260B 5030 Analysis Date: 2/17/2015 SeqNo: 250786

Analyte Result **PQL** SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD **RPDLimit** Qual

Sample ID: CCB	SampType: CCB	TestCode: 8260_S	Units: µg/Kg	Prep Date:	RunNo: <b>18895</b>
Client ID: CCB	Batch ID: 8936	TestNo: SW8260B	5030	Analysis Date: 2/17/2015	SeqNo: <b>250787</b>
Analyte	Result	PQL SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual
1,1,1,2-Tetrachloroethane	ND	10.0			
1,1,1-Trichloroethane	ND	10.0			
1,1,2,2-Tetrachloroethane	ND	10.0			
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	10.0			
1,1,2-Trichloroethane	ND	10.0			
1,1-Dichloroethane	ND	10.0			
1,1-Dichloroethene	ND	10.0			
1,1-Dichloropropene	ND	10.0			
1,2,3-Trichlorobenzene	ND	10.0			
1,2,3-Trichloropropane	ND	10.0			
1,2,4-Trichlorobenzene	ND	10.0			
1,2,4-Trimethylbenzene	ND	10.0			
1,2-Dibromo-3-chloropropane	ND	10.0			
1,2-Dibromoethane	ND	10.0			
1,2-Dichlorobenzene	ND	10.0			
1,2-Dichloroethane	ND	10.0			
1,2-Dichloropropane	ND	10.0			
1,3,5-Trimethylbenzene	ND	10.0			
1,3-Dichlorobenzene	ND	10.0			

Qualifiers: Analyte detected in the associated Method Blank

Η

Holding times for preparation or analysis exceeded

Not Detected at the Reporting Limit

Spike Recovery outside accepted recove

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RSD is greater than RSDlimit

RPD outside accepted recovery limits

1502131 WO#:

20-Feb-15

# **Specialty Analytical**

Maul Foster & Alongi **Client:** 

**Project:** Siltronic / 8128.01.08/08 TestCode: 8260\_S

Sample ID: CCB	SampType: CCB	TestCod	e: <b>8260_S</b>	Units: µg/Kg		Prep Da	te:		RunNo: <b>188</b>	95	
Client ID: CCB	Batch ID: 8936	TestN	o: <b>SW8260B</b>	5030		Analysis Da	te: <b>2/17/2</b> 0	15	SeqNo: <b>250</b>	787	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,3-Dichloropropane	ND	10.0									
1,4-Dichlorobenzene	ND	10.0									
2,2-Dichloropropane	ND	10.0									
2-Butanone	ND	20.0									
2-Chlorotoluene	ND	10.0									
2-Hexanone	ND	20.0									
4-Chlorotoluene	ND	10.0									
4-Isopropyltoluene	ND	10.0									
4-Methyl-2-pentanone	ND	20.0									
Acetone	ND	50.0									
Benzene	ND	10.0									
Bromobenzene	ND	10.0									
Bromochloromethane	ND	10.0									
Bromodichloromethane	ND	10.0									
Bromoform	ND	10.0									
Bromomethane	ND	10.0									
Carbon disulfide	ND	10.0									
Carbon tetrachloride	ND	10.0									
Chlorobenzene	ND	10.0									
Chloroethane	ND	10.0									
Chloroform	ND	10.0									
Chloromethane	ND	10.0									
cis-1,2-Dichloroethene	ND	10.0									
cis-1,3-Dichloropropene	ND	10.0									
Dibromochloromethane	ND	10.0									
Dibromomethane	ND	10.0									
Qualifiers: B Analyte detec	cted in the associated Method Blan	nk	H Holdin	ng times for preparation	or analysis	exceeded	ND I	Not Detected at the	Reporting Limit	t Pag	ge 12 of 28

RPD outside accepted recovery limits

Spike Recovery outside accepted recove

RSD is greater than RSDlimit

WO#:

1502131

20-Feb-15

**Specialty Analytical** 

**Client:** 

Maul Foster & Alongi

**Project:** Siltronic / 8128.01.08/08 **TestCode:** 8260\_S

Sample ID: CCB	SampType: CCB	TestCod	de: <b>8260_S</b>	Units: µg/Kg		Prep Da	te:		RunNo: <b>188</b>	395	
Client ID: CCB	Batch ID: 8936	TestN	lo: <b>SW8260B</b>	5030		Analysis Da	te: <b>2/17/2</b> 0	15	SeqNo: <b>250</b>	787	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dichlorodifluoromethane	ND	10.0									
Ethylbenzene	ND	10.0									
Hexachlorobutadiene	ND	10.0									
Isopropylbenzene	ND	10.0									
m,p-Xylene	ND	20.0									
Methyl tert-butyl ether	ND	10.0									
Methylene chloride	ND	50.0									
Naphthalene	ND	10.0									
n-Butylbenzene	ND	10.0									
n-Propylbenzene	ND	10.0									
o-Xylene	ND	10.0									
sec-Butylbenzene	ND	10.0									
Styrene	ND	10.0									
ert-Butylbenzene	ND	10.0									
Tetrachloroethene	ND	10.0									
Toluene	ND	10.0									
trans-1,2-Dichloroethene	ND	10.0									
rans-1,3-Dichloropropene	ND	10.0									
Trichloroethene	ND	10.0									
Trichlorofluoromethane	ND	10.0									
Vinyl chloride	ND	10.0									
Surr: 1,2-Dichloroethane-d4	104		100.0		104	71.5	112				
Surr: 4-Bromofluorobenzene	97.0		100.0		97.0	75.7	122				
Surr: Dibromofluoromethane	110		100.0		110	64.3	124				
Surr: Toluene-d8	102		100.0		102	74.9	120				

Qualifiers:

Analyte detected in the associated Method Blank

Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

Page 13 of 28

O RSD is greater than RSDlimit

R RPD outside accepted recovery limits

S Spike Recovery outside accepted recove

WO#:

1502131

20-Feb-15

# **Specialty Analytical**

Maul Foster & Alongi **Client:** 

Sample ID: CCV-8941	SampType: CCV		de: <b>8270LL_S</b>	Units: µg/Kg		Prep Date			RunNo: <b>189</b>		
Client ID: CCV	Batch ID: <b>8941</b>	TestN	lo: <b>SW8270D</b>	SW 3545A		Analysis Date	e: 2/18/20 <sup>-</sup>	15	SeqNo: <b>250</b>	892	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,4-Dichlorobenzene	1120	33.3	1333	0	84.2	80	120				
2,4,6-Trichlorophenol	1490	33.3	1333	0	112	80	120				
2,4-Dichlorophenol	1440	33.3	1333	0	108	80	120				
2-Nitrophenol	1520	167	1333	0	114	80	120				
4-Chloro-3-methylphenol	1530	33.3	1333	0	115	80	120				
Acenaphthene	1580	33.3	1333	0	118	80	120				
Benzo(a)pyrene	1560	33.3	1333	0	117	80	120				
Di-n-octyl phthalate	1550	33.3	1333	0	117	80	120				
Fluoranthene	1580	33.3	1333	0	119	80	120				
Hexachlorobutadiene	1500	33.3	1333	0	112	80	120				
N-Nitrosodiphenylamine	1510	33.3	1333	0	113	80	120				
Pentachlorophenol	1080	50.0	1333	0	80.9	80	120				
Phenol	1580	33.3	1333	0	119	80	120				
Sample ID: LCS-8941	SampType: LCS	TestCoo	de: <b>8270LL_S</b>	Units: µg/Kg		Prep Date	e: 2/17/20	15	RunNo: 189	26	
Client ID: LCSS	Batch ID: 8941	TestN	lo: <b>SW8270D</b>	SW 3545A		Analysis Date	e: <b>2/18/20</b>	15	SeqNo: <b>250</b>	893	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2,4-Trichlorobenzene	1320	33.3	1667	0	79.2	30.9	106				
1,4-Dichlorobenzene	1130	33.3	1667	0	68.0	31.4	98.2				
2,4-Dinitrotoluene	1330	33.3	1667	0	79.6	59.7	111				
2-Chlorophenol	1390	33.3	1667	0	83.7	46.2	105				
4-Chloro-3-methylphenol	1810	33.3	1667	0	109	47.4	114				
4-Nitrophenol	1940	167	1667	0	116	45.3	114				SO
Qualifiers: B Analyte d	letected in the associated Method Bl		H Holdin	g times for preparation			ND N	Not Detected at the		Pag	

WO#:

1502131

20-Feb-15

# **Specialty Analytical**

**Client:** Maul Foster & Alongi

<b>Project:</b> Siltronic	2 / 8128.01.08/08					TestCode: 8270LL_S							
Sample ID: LCS-8941 SampType: LCS Client ID: LCSS Batch ID: 8941		_		Units: µg/Kg SW 3545A		Prep Date Analysis Date	e: <b>2/17/20</b> <sup>o</sup>	RunNo: <b>189</b> SeqNo: <b>250</b>					
Analyte	Result	PQL SF	PK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual		
Acenaphthene	1600	33.3	1667	0	95.8	48.2	105						
N-Nitrosodi-n-propylamine	1690	33.3	1667	0	102	42.4	101				SO		
Pentachlorophenol	843	50.0	1667	0	50.6	46.8	120						
Phenol	1600	33.3	1667	0	95.9	51.1	103						
Pyrene	1390	33.3	1667	0	83.2	56.7	130						
Sample ID: MB-8941	SampType: MBLK	TestCode: 8	270LL_S	Units: µg/Kg		Prep Date	e: <b>2/17/20</b> °	15	RunNo: 189	926			
Client ID: PBS	Batch ID: 8941	TestNo: S	W8270D	SW 3545A		Analysis Date	e: <b>2/18/20</b>	15	SeqNo: <b>25</b> 0	0894			
Analyte	Result	POI SE	PK value	SPK Ref Val	%RFC	I owl imit	Highl imit	RPD Ref Val	%RPD	RPDI imit	Qual		

Client ID: PBS	Batch ID: <b>8941</b>	TestN	lo: <b>SW8270D</b>	SW 3545A		Analysis Da	te: <b>2/18/2</b> 0	115	SeqNo: 250	0894	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2,4-Trichlorobenzene	ND	33.3									
1,2-Dichlorobenzene	ND	33.3									
1,2-Diphenylhydrazine	ND	167									
1,3-Dichlorobenzene	ND	33.3									
1,4-Dichlorobenzene	ND	33.3									
1-Methylnaphthalene	ND	33.3									
2,4,5-Trichlorophenol	ND	33.3									
2,4,6-Trichlorophenol	ND	33.3									
2,4-Dichlorophenol	ND	33.3									
2,4-Dimethylphenol	ND	33.3									
2,4-Dinitrophenol	ND	333									
2,4-Dinitrotoluene	ND	33.3									
2,6-Dinitrotoluene	ND	33.3									
2-Chloronaphthalene	ND	33.3									

Analyte detected in the associated Method Blank Qualifiers:

RPD outside accepted recovery limits

Η

Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

Page 15 of 28

RSD is greater than RSDlimit

Spike Recovery outside accepted recove

WO#:

1502131

20-Feb-15

**Specialty Analytical** 

Client: Maul Foster & Alongi

**Project:** Siltronic / 8128.01.08/08 **TestCode: 8270LL\_S** 

Sample ID: MB-8941	SampType: MBLK	TestCode: 8270LL_	S Units: μg/Kg		Prep Dat	te: <b>2/17/20</b>	15	RunNo: 189	926	
Client ID: PBS	Batch ID: 8941	TestNo: SW8270	SW 3545A		Analysis Da	te: <b>2/18/20</b>	15	SeqNo: <b>250</b>	894	
Analyte	Result	PQL SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
2-Chlorophenol	ND	33.3								
2-Methylnaphthalene	ND	33.3								
2-Methylphenol	ND	33.3								
2-Nitroaniline	ND	33.3								
2-Nitrophenol	ND	167								
3-&4-Methylphenol	ND	33.3								
3,3-Dichlorobenzidine	ND	167								
3-Nitroaniline	ND	33.3								
4,6-Dinitro-2-methylphenol	ND	167								
4-Bromophenyl phenyl ether	ND	33.3								
4-Chloro-3-methylphenol	ND	33.3								
4-Chloroaniline	ND	33.3								
4-Chlorophenyl phenyl ether	ND	33.3								
4-Nitroaniline	ND	33.3								
4-Nitrophenol	ND	167								
Acenaphthene	ND	33.3								
Acenaphthylene	ND	33.3								
Aniline	ND	33.3								
Anthracene	ND	33.3								
Benz(a)anthracene	ND	33.3								
Benzidine	ND	167								
Benzo(a)pyrene	ND	33.3								
Benzo(b)fluoranthene	ND	33.3								
Benzo(g,h,i)perylene	ND	33.3								
Benzo(k)fluoranthene	ND	33.3								
Benzoic Acid	ND	667								

Qualifiers:

Analyte detected in the associated Method Blank

Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

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WO#:

1502131

20-Feb-15

**Specialty Analytical** 

Maul Foster & Alongi **Client: Project:** Siltronic / 8128.01.08/08

TestCode: 8270LL\_S

Sample ID: MB-8941 Client ID: PBS	SampType: MBLK  Batch ID: 8941		e: <b>8270LL_S</b> b: <b>SW8270D</b>	Units: µg/Kg SW 3545A		Prep Da Analysis Da	te: 2/17/20		RunNo: <b>189</b> SeqNo: <b>250</b>		
Client ID. 1 B3	Datch ID. 0341	1630140	J. 3440270D	3W 3343A		Allalysis Da	le. 2/10/20	,113	36q1 <b>1</b> 0. <b>23</b> 0	7034	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzyl Alcohol	ND	33.3									
Benzyl butyl phthalate	ND	33.3									
Bis(2-chloroethoxy)methane	ND	33.3									
Bis(2-chloroethyl)ether	ND	33.3									
Bis(2-chloroisopropyl)ether	ND	33.3									
Bis(2-ethylhexyl)phthalate	ND	33.3									
Carbazole	ND	33.3									
Chrysene	ND	33.3									
Dibenz(a,h)anthracene	ND	33.3									
Dibenzofuran	ND	33.3									
Diethyl phthalate	ND	33.3									
Dimethyl phthalate	ND	33.3									
Di-n-butyl phthalate	ND	50.0									
Di-n-octyl phthalate	ND	33.3									
Fluoranthene	ND	33.3									
Fluorene	ND	33.3									
Hexachlorobenzene	ND	33.3									
Hexachlorobutadiene	ND	33.3									
Hexachlorocyclopentadiene	ND	33.3									
Hexachloroethane	ND	33.3									
Indeno(1,2,3-cd)pyrene	ND	33.3									
Isophorone	ND	33.3									
Naphthalene	ND	33.3									
Nitrobenzene	ND	33.3									
N-Nitrosodimethylamine	ND	33.3									
N-Nitrosodi-n-propylamine	ND	33.3									
Qualifiers: B Analyte dete	ected in the associated Method Bla	nk	H Holdin	g times for preparation	or analysis	exceeded	ND 1	Not Detected at the	Reporting Limi	t Pag	e 17 of 28

Spike Recovery outside accepted recove

Analyte detected in the associated Method Blank

ND Not Detected at the Reporting Limit

Page 17 of 28

Spike Recovery outside accepted recove

WO#:

1502131

20-Feb-15

**Specialty Analytical** 

Client: Maul Foster & Alongi

O RSD is greater than RSDlimit

**Project:** Siltronic / 8128.01.08/08 **TestCode: 8270LL\_S** 

Sample ID: MB-8941 Client ID: PBS	SampType: MBLK  Batch ID: 8941		de: <b>8270LL_S</b> do: <b>SW8270D</b>	Units: µg/Kg SW 3545A		Prep Dat Analysis Dat	e: <b>2/17/20</b> e: <b>2/18/20</b>		RunNo: <b>189</b> SeqNo: <b>250</b>		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
N-Nitrosodiphenylamine	ND	33.3									
Pentachlorophenol	ND	50.0									
Phenanthrene	ND	33.3									
Phenol	ND	33.3									
Pyrene	ND	33.3									
Pyridine	ND	167									
Surr: 2,4,6-Tribromophenol	2950		3333		88.6	57.8	119				
Surr: 2-Fluorobiphenyl	2710		3333		81.3	52.6	93.2				
Surr: 2-Fluorophenol	3590		3333		108	40.7	111				
Surr: 4-Terphenyl-d14	2720		3333		81.6	49.8	118				
Surr: Nitrobenzene-d5	3460		3333		104	44.8	103				S
Surr: Phenol-d6	3380		3333		102	47.5	117				
Sample ID: <b>1502126-002BMS</b>	SampType: <b>MS</b>	TestCo	de: <b>8270LL_S</b>	Units: µg/Kg		Prep Dat	e: <b>2/17/20</b>	15	RunNo: <b>18</b> 9	926	
Client ID: ZZZZZZ	Batch ID: 8941	TestN	lo: <b>SW8270D</b>	SW 3545A		Analysis Dat	e: <b>2/18/20</b>	15	SeqNo: <b>250</b>	)895	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2,4-Trichlorobenzene	1040	33.3	1667	0	62.7	31.1	92.7				
1,4-Dichlorobenzene	1220	33.3	1667	0	73.1	16.5	85.6				
	1070	33.3	1667	13.00	63.6	43.4	118				
2,4-Dinitrotoluene			1667	0	58.1	36.8	103				
	968	33.3	1007	-							
2-Chlorophenol		33.3 33.3	1667	0	96.9	49.5	119				
2,4-Dinitrotoluene 2-Chlorophenol 4-Chloro-3-methylphenol 4-Nitrophenol	968				96.9 86.0	49.5 45	119 111				

RPD outside accepted recovery limits

1502131 WO#:

20-Feb-15

## **Specialty Analytical**

Maul Foster & Alongi **Client: Project:** Siltronic / 8128.01.08/08

TestCode: 8270LL\_S

Sample ID: 1502126-002BMS Client ID: ZZZZZZ	SampType: MS Batch ID: 8941		le: <b>8270LL_S</b> lo: <b>SW8270D</b>	Units: µg/Kg SW 3545A	Prep Date: <b>2/17/2015</b> Analysis Date: <b>2/18/2015</b>			RunNo: <b>18926</b> SeqNo: <b>250895</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
N-Nitrosodi-n-propylamine	1180	33.3	1667	0	71.1	45.6	94.1				
Pentachlorophenol	635	50.0	1667	0	38.1	36.6	112				
Phenol	1470	33.3	1667	0	88.4	37.7	107				
Pyrene	945	33.3	1667	157.7	47.2	42.4	131				

Sample ID: 1502126-002BMSD	SampType: MSD	TestCod	de: <b>8270LL_S</b>	Units: µg/Kg		Prep Da	te: <b>2/17/20</b>	15	RunNo: <b>189</b>	926	
Client ID: ZZZZZZ	Batch ID: 8941	TestN	lo: <b>SW8270D</b>	SW 3545A		Analysis Da	te: <b>2/18/20</b>	15	SeqNo: <b>250</b>	0896	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2,4-Trichlorobenzene	1220	33.3	1667	0	73.0	31.1	92.7	1044	15.3	20	
1,4-Dichlorobenzene	1260	33.3	1667	0	75.6	16.5	85.6	1218	3.42	20	
2,4-Dinitrotoluene	1190	33.3	1667	13.00	70.5	43.4	118	1072	10.2	20	
2-Chlorophenol	1250	33.3	1667	0	74.9	36.8	103	968.3	25.3	20	R
4-Chloro-3-methylphenol	1610	33.3	1667	0	96.9	49.5	119	1616	0.0826	20	
4-Nitrophenol	1920	167	1667	0	115	45	111	1434	28.8	20	SR
Acenaphthene	1570	33.3	1667	31.67	92.4	45.1	102	1172	29.1	20	R
N-Nitrosodi-n-propylamine	1540	33.3	1667	0	92.6	45.6	94.1	1185	26.3	20	R
Pentachlorophenol	834	50.0	1667	0	50.0	36.6	112	635.0	27.1	20	R
Phenol	1820	33.3	1667	0	109	37.7	107	1474	20.9	20	SR
Pyrene	1650	33.3	1667	157.7	89.8	42.4	131	945.0	54.6	20	R

Analyte detected in the associated Method Blank Qualifiers:

RPD outside accepted recovery limits

Η

Spike Recovery outside accepted recove

Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

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WO#:

SeqNo: **251075** 

%RPD

**RPDLimit** 

Qual

Analysis Date: 2/18/2015

LowLimit HighLimit RPD Ref Val

%REC

1502131

20-Feb-15

Analytical

ICV

Client ID:

Analyte

Sample ID: F	R18935ICV	SampType: ICV	TestCode: CN_S	Units: mg/Kg	Prep Date:		RunNo: <b>18935</b>	
Project:	Siltroni	c / 8128.01.08/08				TestCode:	CN_S	
Client:	Maul F	oster & Alongi						

SPK value SPK Ref Val

TestNo: SW9012B

**PQL** 

Cyanide, Total	0.323	0.0200	0.3000	0	108	90	110			
Sample ID: MB-R18935	SampType: <b>MBLK</b>	TestCode	e: CN_S	Units: mg/Kg		Prep Date	e:	RunNo: 189	935	
Client ID: PBS	Batch ID: R18935	TestNo	: SW9012B			Analysis Date	e: <b>2/18/2015</b>	SeqNo: <b>251</b>	1076	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	ND	0.0200								

Sample ID: LCS-R18935	SampType: <b>LCS</b>	TestCoo	de: CN_S	Units: mg/Kg		Prep Da	te:		RunNo: 189	35	
Client ID: LCSS	Batch ID: R18935	TestN	lo: <b>SW9012B</b>			Analysis Da	te: <b>2/18/20</b>	15	SeqNo: <b>251</b>	1077	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	0.227	0.0200	0.2000	0	114	85	115				

Sample ID: R18935CCV	SampType: CCV	TestCod	e: CN_S	Units: mg/Kg		Prep Da	te:		RunNo: <b>189</b>	35	
Client ID: CCV	Batch ID: R18935	TestN	o: <b>SW9012B</b>			Analysis Da	te: <b>2/18/2015</b>		SeqNo: <b>251</b>	078	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit RPI	D Ref Val	%RPD	RPDLimit	Qual
Cvanide, Total	0.368	0.0200	0.3500	0	105	90	110				

Analyte detected in the associated Method Blank Qualifiers:

RPD outside accepted recovery limits

Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

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RSD is greater than RSDlimit

Batch ID: R18935

Result

Spike Recovery outside accepted recove

WO#:

1502131

20-Feb-15

**Specialty Analytical** 

**Client:** 

Maul Foster & Alongi

<b>Project:</b> Siltronic / 8	3128.01.08/08				TestCode: C	CN_S	
Sample ID: 1502126-001BMS	SampType: MS	TestCode: CN_S	Units: mg/Kg	Prep Date	e:	RunNo: <b>18935</b>	
Client ID: ZZZZZZ	Batch ID: <b>R18935</b>	TestNo: SW9012B		Analysis Date	e: <b>2/18/2015</b>	SeqNo: <b>251082</b>	
Analyte	Result	PQL SPK value	SPK Ref Val	%REC LowLimit	HighLimit RPD Ref Val	%RPD RPDLimit	Qual
Cyanide, Total	1.08	0.100 0.1000	1.006	70.5 80	120		SMC
Sample ID: 1502126-001BMSD	SampType: MSD	TestCode: CN_S	Units: mg/Kg	Prep Date	e:	RunNo: <b>18935</b>	
Client ID: ZZZZZZ	Batch ID: <b>R18935</b>	TestNo: SW9012B		Analysis Date	e: <b>2/18/2015</b>	SeqNo: <b>251083</b>	
Analyte	Result	PQL SPK value	SPK Ref Val	%REC LowLimit	HighLimit RPD Ref Val	%RPD RPDLimit	Qual
Cyanide, Total	1.04	0.100 0.1000	1.006	32.5 80	120 1.076	3.59 20	SMC
Sample ID: R18935CCV	SampType: CCV	TestCode: CN_S	Units: mg/Kg	Prep Date	e:	RunNo: <b>18935</b>	
Client ID: CCV	Batch ID: R18935	TestNo: SW9012B		Analysis Date	e: <b>2/18/2015</b>	SeqNo: <b>251084</b>	
Analyte	Result	PQL SPK value	SPK Ref Val	%REC LowLimit	HighLimit RPD Ref Val	%RPD RPDLimit	Qual

Sample ID: R18935CCV	SampType: CCV	TestCode: CN_S	Units: mg/Kg		Prep Date:	:		RunNo: 189	35	
Client ID: CCV	Batch ID: R18935	TestNo: SW9012B			Analysis Date:	2/18/201	15	SeqNo: <b>251</b>	084	
Analyte	Result	PQL SPK value	SPK Ref Val	%REC	LowLimit H	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	0.381	0.0200 0.3500	0	109	90	110				

Η

Holding times for preparation or analysis exceeded

WO#: **1502131** 

20-Feb-15

# **Specialty Analytical**

Client:	Maul Foster	•						<b>T</b>	4G 1 T	ra ar		
Project:	Siltronic / 8	3128.01.08/08						Te	stCode: H	IG_CT		
Sample ID: N	MB-8944	SampType: MBLK	TestCode	e: <b>HG_CT</b>	Units: mg/L		Prep Date	: 2/17/2015	5	RunNo: 189	)10	
Client ID: P	PBW	Batch ID: 8944	TestNo	o: <b>E7470A</b>	E245.1		Analysis Date	2/17/2015	5	SeqNo: <b>250</b>	577	
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit I	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury, TCL	P	ND	0.000100									
Sample ID: L	_CS-8944	SampType: <b>LCS</b>	TestCode	e: <b>HG_CT</b>	Units: mg/L		Prep Date	: 2/17/201	5	RunNo: 189	)10	
Client ID: L	_csw	Batch ID: 8944	TestNo	o: <b>E7470A</b>	E245.1		Analysis Date	2/17/2015	5	SeqNo: <b>250</b>	578	
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit I	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury, TCL	P	0.00379	0.000100	0.004000	0	94.7	85.4	116				
Sample ID: 1	1502126-002BMS	SampType: <b>MS</b>	TestCode	e: <b>HG_CT</b>	Units: mg/L		Prep Date	: 2/17/201	5	RunNo: 189	)10	
Client ID: Z	ZZZZZZ	Batch ID: 8944	TestNo	o: <b>E7470A</b>	E245.1		Analysis Date	: 2/17/2015	5	SeqNo: <b>250</b>	584	
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit I	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury, TCL	.P	0.00407	0.000100	0.004000	0	102	69.5	125				
Sample ID: 1	1502126-002BMSD	SampType: <b>MSD</b>	TestCode	e: <b>HG_CT</b>	Units: mg/L		Prep Date	: 2/17/201	5	RunNo: 189	)10	
Client ID: Z	ZZZZZZ	Batch ID: 8944	TestNo	o: <b>E7470A</b>	E245.1		Analysis Date	2/17/2015	5	SeqNo: 250	585	
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit I	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury, TCL	_P	0.00382	0.000100	0.004000	0	95.5	69.5	125	0.004069	6.31	20	

Qualifiers: B Analyte detected in the associated Method Blank

R RPD outside accepted recovery limits

Η

Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

Page 22 of 28

O RSD is greater than RSDlimit

S Spike Recovery outside accepted recove

WO#:

1502131

20-Feb-15

**Specialty Analytical** 

**Client:** 

Maul Foster & Alongi

**Project:** Siltronic / 8128.01.08/08 TestCode: HG\_CT

Sample ID: CCV	SampType: CCV	TestCod	le: <b>HG_CT</b>	Units: mg/L		Prep Da	te:		RunNo: 189	910	
Client ID: CCV	Batch ID: 8944	TestN	lo: <b>E7470A</b>	E245.1		Analysis Da	te: <b>2/17/20</b>	15	SeqNo: <b>250</b>	588	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury, TCLP	0.00371	0.000100	0.004000	0	92.8	90	110				

Η

Holding times for preparation or analysis exceeded

WO#:

1502131

20-Feb-15

Client: Project:		Maul Foster & Alongi Siltronic / 8128.01.08/08					TestCode:	NWTPHDX_S	
Sample ID:	CCV	SampType: CCV	TestCode: NWTPHDX_S	Units: mg/Kg		Prep Date	e:	RunNo: <b>18906</b>	
Client ID:	CCV	Batch ID: 8931	TestNo: <b>NWTPH-Dx</b>	SW3545A		Analysis Date	e: <b>2/16/2015</b>	SeqNo: <b>250542</b>	
Analyte		Result	PQL SPK value SI	PK Ref Val	%REC	LowLimit	HighLimit RPD Ref Val	%RPD RPDLimit	Qual
Diesel		1400	15.0 1332	0	105	85	115		
Lube Oil		731	50.0 666.0	0	110	85	115		
Sample ID:	MB-893	SampType: MBLK	TestCode: NWTPHDX_S	Units: mg/Kg		Prep Date	e: <b>2/16/2015</b>	RunNo: <b>18906</b>	
Client ID:	PBS	Batch ID: 8931	TestNo: NWTPH-Dx	SW3545A		Analysis Date	e: <b>2/16/2015</b>	SeqNo: <b>250543</b>	
Analyte		Result	PQL SPK value Si	PK Ref Val	%REC	LowLimit	HighLimit RPD Ref Val	%RPD RPDLimit	Qual
Diesel		ND	15.0						
Lube Oil		ND	50.0						
Surr: o-T	erphenyl	28.9	33.33		86.6	50	150		
Sample ID:	LCS-89	SampType: LCS	TestCode: NWTPHDX_S	Units: mg/Kg		Prep Date	e: <b>2/16/2015</b>	RunNo: <b>18906</b>	
Client ID:	LCSS	Batch ID: 8931	TestNo: <b>NWTPH-Dx</b>	SW3545A		Analysis Date	e: <b>2/16/2015</b>	SeqNo: <b>250544</b>	
Analyte		Result	PQL SPK value SI	PK Ref Val	%REC	LowLimit	HighLimit RPD Ref Val	%RPD RPDLimit	Qual
Diesel		159	15.0 166.7	0	95.3	76.3	125		
Lube Oil		128	50.0 166.7	0	76.7	69.9	127		
Sample ID:	ccv	SampType: CCV	TestCode: NWTPHDX_S	Units: mg/Kg		Prep Date	e:	RunNo: <b>18906</b>	
Client ID:	CCV	Batch ID: 8931	TestNo: <b>NWTPH-Dx</b>	SW3545A		Analysis Date	e: <b>2/17/2015</b>	SeqNo: <b>250546</b>	
Analyte		Result	PQL SPK value SI	PK Ref Val	%REC	LowLimit	HighLimit RPD Ref Val	%RPD RPDLimit	Qual

Qualifiers: B Analyte detected in the associated Method Blank

R RPD outside accepted recovery limits

Н

Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

Page 24 of 28

O RSD is greater than RSDlimit

S Spike Recovery outside accepted recove

ND Not Detected at the Reporting Limit

Spike Recovery outside accepted recove

WO#:

1502131

20-Feb-15

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Qualifiers:

Analyte detected in the associated Method Blank

RSD is greater than RSDlimit

~**	26.15	0.41						
Client: Project:		ter & Alongi / 8128.01.08/08			ŗ	TestCode: N	NWTPHDX_S	
Sample ID:	CCV	SampType: CCV	TestCode: NWTPHDX_S Units: mg/Kg		Prep Date:		RunNo: <b>18906</b>	
Client ID:	CCV	Batch ID: 8931	TestNo: NWTPH-Dx SW3545A		Analysis Date: 2/17/20	015	SeqNo: <b>250546</b>	
Analyte		Result	PQL SPK value SPK Ref Val	%REC	LowLimit HighLimit	RPD Ref Val	%RPD RPDLimit	Qual
Diesel		1050	15.0 999.0 0	105	85 115			
Lube Oil		529	50.0 499.5 0	106	85 115			
Sample ID:	ССВ	SampType: CCB	TestCode: NWTPHDX_S Units: mg/Kg		Prep Date:		RunNo: <b>18906</b>	
Client ID:	ССВ	Batch ID: 8931	TestNo: NWTPH-Dx SW3545A		Analysis Date: 2/17/20	)15	SeqNo: <b>250547</b>	
Analyte		Result	PQL SPK value SPK Ref Val	%REC	LowLimit HighLimit	RPD Ref Val	%RPD RPDLimit	Qual
Diesel		ND	15.0					
Lube Oil		ND	50.0					
Surr: o-Te	erphenyl	28.5	33.30	85.5	50 150			
Sample ID:	1502131-001ADUP	SampType: <b>DUP</b>	TestCode: NWTPHDX_S Units: mg/Kg-	dry	Prep Date: 2/16/20	)15	RunNo: <b>18906</b>	
Client ID:	DROPBOX-SO	Batch ID: 8931	TestNo: <b>NWTPH-Dx SW3545A</b>		Analysis Date: 2/17/20	015	SeqNo: <b>250551</b>	
Analyte		Result	PQL SPK value SPK Ref Val	%REC	LowLimit HighLimit	RPD Ref Val	%RPD RPDLimit	Qual
Diesel		1160	20.9			878.4	27.7 20	RA1
Lube Oil		334	69.5			229.1	37.3 20	RA2
Sample ID:	CCV	SampType: CCV	TestCode: NWTPHDX_S Units: mg/Kg		Prep Date:		RunNo: <b>18906</b>	
Client ID:	CCV	Batch ID: 8931	TestNo: <b>NWTPH-Dx SW3545A</b>		Analysis Date: 2/17/20	015	SeqNo: <b>250556</b>	
Analyte		Result	PQL SPK value SPK Ref Val	%REC	LowLimit HighLimit	RPD Ref Val	%RPD RPDLimit	Qual

Holding times for preparation or analysis exceeded

RPD outside accepted recovery limits

Η

WO#:

1502131

20-Feb-15

**Specialty Analytical** 

**Client:** 

Maul Foster & Alongi

**Project:** Siltronic / 8128.01.08/08 TestCode: NWTPHDX\_S

Sample ID: CCV Client ID: CCV	SampType: CCV Batch ID: 8931		de: NWTPHDX	X_S Units: mg/Kg		Prep Dat Analysis Dat	te: te: <b>2/17/201</b>	5	RunNo: <b>189</b> SeqNo: <b>250</b>		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	1430	15.0	1332	0	107	85	115				
Lube Oil	732	50.0	666.0	0	110	85	115				

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Holding times for preparation or analysis exceeded

WO#:

1502131

20-Feb-15

<b>Specialty</b>	Analytical
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Olt 4	M IF	0 41 '			
Client: Project:	Maul Foste Siltronic / 8	8128.01.08/08		TestCode:	NWTPHGX_S
Sample ID: C	ccv	SampType: CCV	TestCode: NWTPHGX_S Units: mg/Kg	Prep Date:	RunNo: <b>18950</b>
Client ID: C	ccv	Batch ID: 8937	TestNo: <b>NWTPH-Gx 5030_G_S</b>	Analysis Date: <b>2/19/2015</b>	SeqNo: <b>251411</b>
Analyte		Result	PQL SPK value SPK Ref Val %F	EC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual
Gasoline		100	2.50 100.0 0	00 80 120	
Sample ID: M	/IB-8937	SampType: <b>MBLK</b>	TestCode: NWTPHGX_S Units: mg/Kg	Prep Date: <b>2/17/2015</b>	RunNo: <b>18950</b>
Client ID: P	PBS	Batch ID: <b>8937</b>	TestNo: <b>NWTPH-Gx 5030_G_S</b>	Analysis Date: <b>2/19/2015</b>	SeqNo: <b>251412</b>
Analyte		Result	PQL SPK value SPK Ref Val %F	EC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual
Gasoline		ND	2.50		
Surr: 4-Bror	mofluorobenzene	4.06	5.000 8	.2 50 150	
Sample ID: L	.CS-8937	SampType: <b>LCS</b>	TestCode: NWTPHGX_S Units: mg/Kg	Prep Date: 2/17/2015	RunNo: <b>18950</b>
Client ID: Lo	.css	Batch ID: 8937	TestNo: <b>NWTPH-Gx 5030_G_S</b>	Analysis Date: 2/19/2015	SeqNo: <b>251413</b>
Analyte		Result	PQL SPK value SPK Ref Val %F	EC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual
Gasoline		58.3	2.50 50.00 0	17 53.5 121	
Sample ID: 1	502126-001ADUP	SampType: <b>DUP</b>	TestCode: NWTPHGX_S Units: mg/Kg-dry	Prep Date: <b>2/17/2015</b>	RunNo: <b>18950</b>
Client ID: Z	ZZZZZ	Batch ID: 8937	TestNo: <b>NWTPH-Gx 5030_G_S</b>	Analysis Date: <b>2/19/2015</b>	SeqNo: <b>251495</b>
Analyte		Result	PQL SPK value SPK Ref Val %f	EC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual
Gasoline		78.5	3.49	21.34	. 115 20 RMI

Qualifiers:

Analyte detected in the associated Method Blank

H Holding times for preparation or analysis exceeded

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O RSD is greater than RSDlimit

R RPD outside accepted recovery limits

WO#:

1502131

20-Feb-15

**Specialty Analytical** 

**Client:** 

Maul Foster & Alongi

**Project:** Siltronic / 8128.01.08/08 TestCode: NWTPHGX\_S

Sample ID: CCV Client ID: CCV	SampType: CCV Batch ID: 8937	TestCode: <b>NWTPHGX_S</b> Units: <b>mg/Kg</b> TestNo: <b>NWTPH-Gx 5030_G_S</b>				Prep Da Analysis Da	te: <b>2/20/20</b>	RunNo: <b>18950</b> SeqNo: <b>251509</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	136	2.50	125.0	0	109	80	120				

- A This sample contains a Gasoline Range Organic not identified as a specific hydrocarbon product. The result was quantified against gasoline calibration standards
- A1 This sample contains a Diesel Range Organic not identified as a specific hydrocarbon product. The result was quantified against diesel calibration standards.
- A2 This sample contains a Lube Oil Range Organic not identified as a specific hydrocarbon product. The result was quantified against a lube oil calibration standard.
- A3 The result was determined to be Non-Detect based on hydrocarbon pattern recognition. The product was carry-over from another hydrocarbon type.
- A4 The product appears to be aged or degraded diesel.
- B The blank exhibited a positive result great than the reporting limit for this compound.
- CN See Case Narrative.
- D Result is based from a dilution.
- E Result exceeds the calibration range for this compound. The result should be considered as estimate.
- F The positive result for this hydrocarbon is due to single component contamination. The product does not match any hydrocarbon in the fuels library.
- G Result may be biased high due to biogenic interferences. Clean up is recommended.
- H Sample was analyzed outside recommended holding time.
- HT At clients request, samples was analyzed outside of recommended holding time.
- J The result for this analyte is between the MDL and the PQL and should be considered as estimated concentration.
- K Diesel result is biased high due to amount of Oil contained in the sample.
- L Diesel result is biased high due to amount of Gasoline contained in the sample.
- M Oil result is biased high due to amount of Diesel contained in the sample.
- MC Sample concentration is greater than 4x the spiked value, the spiked value is considered insignificant.
- MI Result is outside control limits due to matrix interference.
- MSA Value determined by Method of Standard Addition.
- O Laboratory Control Standard (LCS) exceeded laboratory control limits, but meets CCV criteria. Data meets EPA requirements.
- Q Detection levels elevated due to sample matrix.
- R RPD control limits were exceeded.
- RF Duplicate failed due to result being at or near the method-reporting limit.
- RP Matrix spike values exceed established QC limits; post digestion spike is in control.
- S Recovery is outside control limits.
- SC Closing CCV or LCS exceeded high recovery control limits, but associated samples are non-detect. Data meets EPA requirements.
- \* The result for this parameter was greater that the maximum contaminant level of the TCLP regulatory limit.

#### **CHAIN OF CUSTODY RECORD**

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# Specialty Analytical

1171 Clack Phon	ecialty Analytical 1 SE Capps Road tamas, OR 97015 e: 503-607-1331 503-607-1336	Company Mail For Address Acci Ni 19 Portland Phone 971-544-2 Project No.8138.01.05								Project Manager James Pegle  Bul Foster & Alongi, Inc.  NW 19th Avenue, Saite 200  Itland OR 97209  SHI-2139 Fax 971-5-  8.01.08/08 Project Name  Bation OR WA Other						544-2	
=	c. littemeier		_			Invoic	e To _	Anal		7 V }-8	4				For Lai	ooratory Use	
Printed  Turn Around Time  Normal 5-7 Bus  □ Rush  Rush Analyses Must Be Sci		No. of Containers	ones	8370	CLP METALS RCRA 81	TPH-Ox	TPH-GX	TOTAL CYANIDE					Shipped \ Air Bill No Temperat Specialty	vire On Rec	realty	_°C Y / N	
Date Time	Sample I.D.	Matrix	<u> </u>	00	00						ļ	<u> </u>			Commen	s	Lab I.D.
2/12/15 1350 D	Rophox-So	SCIL	3														
Relinquished By Kairana	Titemale 2/13/15 Time 2/18/13 1/28	Received						50	7	l	inquist npany:	-		Z	1	Date 2/(3/(¢	Time
	Will Be Disposed of 60 Days After Receipt. subject to storage fee(s)									Red	eived Nd	Å	ab By:	giva	L	Date 2 13 15	Time (3.00



11711 SE Capps Road, Ste B Clackamas, Oregon 97015 TEL: 503-607-1331 FAX: 503-607-1336 Website: www.specialtyanalytical.com

February 20, 2015

James Peale Maul Foster & Alongi 400 E. Mill Plain Blvd. Suite 400 Vancouver, WA 98660

TEL: (360) 694-2691 FAX (360) 906-1958

RE: Siltronic / 8128.01.08/08

Dear James Peale: Order No.: 1502132

Specialty Analytical received 2 sample(s) on 2/13/2015 for the analyses presented in the following report.

There were no problems with the analysis and all data for associated QC met EPA or laboratory specifications, except where noted in the Case Narrative, or as qualified with flags. Results apply only to the samples analyzed. Without approval of the laboratory, the reproduction of this report is only permitted in its entirety.

If you have any questions regarding these tests, please feel free to call.

Sincerely,

Marty French Lab Director

CLIENT: Maul Foster & Alongi Collection Date: 2/12/2015 4:30:00 PM

**Date Reported:** 

20-Feb-15

**Project:** Siltronic / 8128.01.08/08

**Lab ID:** 1502132-001

Analyses	Result	RL	Qual	Unit	DF	Date Analyzed
NWTPH-DX - RBC		NWTPH-DX				Analyst: BS
Diesel	41.8	1.55	A1	mg/L	20	2/16/2015 6:13:01 PM
Lube Oil	14.5	3.88	A2	mg/L	20	2/16/2015 6:13:01 PM
Surr: o-Terphenyl	4.80	50-150	SMI	%REC	20	2/16/2015 6:13:01 PM
NWTPH-GX		NWTPH-GX				Analyst: BS
Gasoline	12600	200		μg/L	2	2/19/2015 10:59:35 AM
Surr: 4-Bromofluorobenzene	2.92	50-150	SMI	%REC	2	2/19/2015 10:59:35 AM
TCLP 8 ICP/MS METALS-TCLP LEA	CHED	E1311/6020				Analyst: <b>KP</b>
Arsenic, TCLP	15.0	5.00		μg/L	1	2/19/2015 5:34:00 PM
Barium, TCLP	720	50.0		μg/L	1	2/19/2015 5:34:00 PM
Cadmium, TCLP	ND	5.00		μg/L	1	2/19/2015 5:34:00 PM
Chromium, TCLP	54.0	5.00		μg/L	1	2/19/2015 5:34:00 PM
Lead, TCLP	77.2	5.00		μg/L	1	2/19/2015 5:34:00 PM
Selenium, TCLP	ND	50.0		μg/L	1	2/19/2015 5:34:00 PM
Silver, TCLP	ND	5.00		μg/L	1	2/19/2015 5:34:00 PM
TCLP 8 TOTAL MERCURY		E7470A				Analyst: <b>BW</b>
Mercury, TCLP	ND	0.000100		mg/L	1	2/17/2015 3:12:09 PM
SEMIVOLATILE ORGANICS-LOW L	.EVEL	SW8270D				Analyst: <b>bda</b>
1,2,4-Trichlorobenzene	ND	9.78	Q	μg/L	10	2/17/2015 1:28:00 PM
1,2-Dichlorobenzene	ND	3.91	Q	μg/L	4	2/17/2015 11:40:00 AM
1,2-Diphenylhydrazine	ND	48.9	Q	μg/L	10	2/17/2015 1:28:00 PM
1,3-Dichlorobenzene	ND	3.91	Q	μg/L	4	2/17/2015 11:40:00 AM
1,4-Dichlorobenzene	ND	3.91	Q	μg/L	4	2/17/2015 11:40:00 AM
1-Methylnaphthalene	1450	97.8		μg/L	100	2/17/2015 12:59:00 PM
2,3,4-Trichlorophenol	ND	9.78	Q	μg/L	10	2/17/2015 1:28:00 PM
2,3,5,6-Tetrachlorophenol	ND	48.9	Q	μg/L	10	2/17/2015 1:28:00 PM
2,3,5-Trichlorophenol	ND	9.78	Q	μg/L	10	2/17/2015 1:28:00 PM
2,3,6-Trichlorophenol	ND	9.78	Q	μg/L	10	2/17/2015 1:28:00 PM
2,4,5-Trichlorophenol	ND	48.9	Q	μg/L	10	2/17/2015 1:28:00 PM
2,4,6-Trichlorophenol	ND	48.9	Q	μg/L	10	2/17/2015 1:28:00 PM
2,4-Dichlorophenol	ND	29.4	Q	μg/L	10	2/17/2015 1:28:00 PM
2,4-Dimethylphenol	ND	9.78	Q	μg/L	10	2/17/2015 1:28:00 PM
2,4-Dinitrophenol	ND	97.8	Q	μg/L	10	2/17/2015 1:28:00 PM
2,4-Dinitrotoluene	ND	48.9	Q	μg/L	10	2/17/2015 1:28:00 PM
2,6-Dinitrotoluene	117	48.9		μg/L	10	2/17/2015 1:28:00 PM
2-Chloronaphthalene	71.1	9.78		μg/L	10	2/17/2015 1:28:00 PM

CLIENT: Maul Foster & Alongi Collection Date: 2/12/2015 4:30:00 PM

**Date Reported:** 

20-Feb-15

**Project:** Siltronic / 8128.01.08/08

**Lab ID:** 1502132-001

Analyses	Result	RL	Qual	Unit	DF	Date Analyzed
SEMIVOLATILE ORGANICS-LO	W LEVEL	SW8270D				Analyst: <b>bda</b>
2-Chlorophenol	ND	3.91	Q	μg/L	4	2/17/2015 11:40:00 AM
2-Methylnaphthalene	2550	97.8		μg/L	100	2/17/2015 12:59:00 PM
2-Methylphenol	ND	7.83	Q	μg/L	4	2/17/2015 11:40:00 AM
2-Nitroaniline	ND	48.9	Q	μg/L	10	2/17/2015 1:28:00 PM
2-Nitrophenol	ND	48.9	Q	μg/L	10	2/17/2015 1:28:00 PM
3-&4-Methylphenol	ND	39.1	Q	μg/L	4	2/17/2015 11:40:00 AM
3,3'-Dichlorobenzidine	ND	19.6	Q	μg/L	4	2/17/2015 11:40:00 AM
3-Nitroaniline	ND	58.7	Q	μg/L	10	2/17/2015 1:28:00 PM
4,6-Dinitro-2-methylphenol	ND	97.8	Q	μg/L	10	2/17/2015 1:28:00 PM
4-Bromophenyl phenyl ether	ND	9.78	Q	μg/L	10	2/17/2015 1:28:00 PM
4-Chloro-3-methylphenol	ND	19.6	Q	μg/L	10	2/17/2015 1:28:00 PM
4-Chloroaniline	ND	29.4	Q	μg/L	10	2/17/2015 1:28:00 PM
4-Chlorophenyl phenyl ether	ND	9.78	Q	μg/L	10	2/17/2015 1:28:00 PM
4-Nitroaniline	ND	48.9	Q	μg/L	10	2/17/2015 1:28:00 PM
4-Nitrophenol	ND	48.9	Q	μg/L	10	2/17/2015 1:28:00 PM
Acenaphthene	2030	97.8		μg/L	100	2/17/2015 12:59:00 PM
Acenaphthylene	89.5	9.78		μg/L	10	2/17/2015 1:28:00 PM
Anthracene	813	9.78		μg/L	10	2/17/2015 1:28:00 PM
Benz(a)anthracene	454	9.78		μg/L	10	2/17/2015 1:28:00 PM
Benzo(a)pyrene	538	9.78		μg/L	10	2/17/2015 1:28:00 PM
Benzo(b)fluoranthene	459	9.78		μg/L	10	2/17/2015 1:28:00 PM
Benzo(g,h,i)perylene	202	3.91		μg/L	4	2/17/2015 11:40:00 AM
Benzo(k)fluoranthene	73.2	3.91		μg/L	4	2/17/2015 11:40:00 AM
Benzoic Acid	ND	196	Q	μg/L	10	2/17/2015 1:28:00 PM
Benzyl Alcohol	ND	19.6	Q	μg/L	4	2/17/2015 11:40:00 AM
Bis(2-chloroethoxy)methane	ND	9.78	Q	μg/L	10	2/17/2015 1:28:00 PM
Bis(2-chloroethyl)ether	ND	7.83	Q	μg/L	4	2/17/2015 11:40:00 AM
Bis(2-chloroisopropyl)ether	ND	3.91	Q	μg/L	4	2/17/2015 11:40:00 AM
Bis(2-ethylhexyl)phthalate	91.7	3.91		μg/L	4	2/17/2015 11:40:00 AM
Butyl benzyl phthalate	ND	3.91	Q	μg/L	4	2/17/2015 11:40:00 AM
Carbazole	327	9.78		μg/L	10	2/17/2015 1:28:00 PM
Chrysene	549	9.78		μg/L	10	2/17/2015 1:28:00 PM
Dibenz(a,h)anthracene	45.5	3.91		μg/L	4	2/17/2015 11:40:00 AM
Dibenzofuran	151	9.78		μg/L	10	2/17/2015 1:28:00 PM
Diethyl phthalate	ND	9.78	Q	μg/L	10	2/17/2015 1:28:00 PM
Dimethyl phthalate	ND	9.78	Q	μg/L	10	2/17/2015 1:28:00 PM
Di-n-butyl phthalate	ND	9.78	Q	μg/L	10	2/17/2015 1:28:00 PM
Di-n-octyl phthalate	ND	3.91	Q	μg/L	4	2/17/2015 11:40:00 AM
Fluoranthene	1760	97.8		μg/L	100	2/17/2015 12:59:00 PM

CLIENT: Maul Foster & Alongi Collection Date: 2/12/2015 4:30:00 PM

**Date Reported:** 

20-Feb-15

**Project:** Siltronic / 8128.01.08/08

**Lab ID:** 1502132-001

Analyses	Result	RL	Qual	Unit	DF	Date Analyzed
SEMIVOLATILE ORGANICS-LOW LE	VEL	SW8270D				Analyst: <b>bda</b>
Fluorene	850	9.78		μg/L	10	2/17/2015 1:28:00 PM
Hexachlorobenzene	ND	9.78	Q	μg/L	10	2/17/2015 1:28:00 PM
Hexachlorobutadiene	ND	19.6	Q	μg/L	10	2/17/2015 1:28:00 PM
Hexachlorocyclopentadiene	ND	48.9	Q	μg/L	10	2/17/2015 1:28:00 PM
Hexachloroethane	7.95	7.83		μg/L	4	2/17/2015 11:40:00 AM
Indeno(1,2,3-cd)pyrene	151	3.91		μg/L	4	2/17/2015 11:40:00 AM
Isophorone	ND	9.78	Q	μg/L	10	2/17/2015 1:28:00 PM
Naphthalene	11000	391		μg/L	400	2/17/2015 12:30:00 PM
Nitrobenzene	ND	9.78	Q	μg/L	10	2/17/2015 1:28:00 PM
N-Nitrosodimethylamine	ND	3.91	Q	μg/L	4	2/17/2015 11:40:00 AM
N-Nitrosodi-n-propylamine	ND	7.83	Q	μg/L	4	2/17/2015 11:40:00 AM
N-Nitrosodiphenylamine	ND	9.78	Q	μg/L	10	2/17/2015 1:28:00 PM
Pentachlorophenol	ND	48.9	Q	μg/L	10	2/17/2015 1:28:00 PM
Phenanthrene	4150	97.8		μg/L	100	2/17/2015 12:59:00 PM
Phenol	ND	7.83	Q	μg/L	4	2/17/2015 11:40:00 AM
Pyrene	1840	97.8		μg/L	100	2/17/2015 12:59:00 PM
Pyridine	ND	19.6	Q	μg/L	4	2/17/2015 11:40:00 AM
Surr: 2,4,6-Tribromophenol	7.60	33.1-99.7	SMI	%REC	10	2/17/2015 1:28:00 PM
Surr: 2-Fluorobiphenyl	24.7	33.1-96.2	SMI	%REC	10	2/17/2015 1:28:00 PM
Surr: 2-Fluorophenol	11.8	13.4-57.1	SMI	%REC	4	2/17/2015 11:40:00 AM
Surr: 4-Terphenyl-d14	12.6	41-122	SMI	%REC	4	2/17/2015 11:40:00 AM
Surr: Nitrobenzene-d5	34.2	28.9-99.9		%REC	10	2/17/2015 1:28:00 PM
Surr: Phenol-d6	9.40	10.6-38.5	SMI	%REC	4	2/17/2015 11:40:00 AM
VOLATILE ORGANICS BY GC/MS		SW8260B				Analyst: <b>CK</b>
1,1,1,2-Tetrachloroethane	ND	1.00		μg/L	1	2/18/2015 6:58:00 PM
1,1,1-Trichloroethane	ND	1.00		μg/L	1	2/18/2015 6:58:00 PM
1,1,2,2-Tetrachloroethane	ND	1.00		μg/L	1	2/18/2015 6:58:00 PM
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	1.00		μg/L	1	2/18/2015 6:58:00 PM
1,1,2-Trichloroethane	ND	1.00		μg/L	1	2/18/2015 6:58:00 PM
1,1-Dichloroethane	ND	1.00		μg/L	1	2/18/2015 6:58:00 PM
1,1-Dichloroethene	ND	1.00		μg/L	1	2/18/2015 6:58:00 PM
1,1-Dichloropropene	ND	1.00		μg/L	1	2/18/2015 6:58:00 PM
1,2,3-Trichlorobenzene	ND	1.00		μg/L	1	2/18/2015 6:58:00 PM
1,2,3-Trichloropropane	ND	1.00		μg/L	1	2/18/2015 6:58:00 PM
1,2,4-Trichlorobenzene	ND	1.00		μg/L	1	2/18/2015 6:58:00 PM
1,2,4-Trimethylbenzene	179	10.0		μg/L	10	2/18/2015 5:53:00 PM
1,2-Dibromo-3-chloropropane	ND	1.00		μg/L	1	2/18/2015 6:58:00 PM
1,2-Dibromoethane	ND	1.00		μg/L	1	2/18/2015 6:58:00 PM

CLIENT: Maul Foster & Alongi Collection Date: 2/12/2015 4:30:00 PM

**Date Reported:** 

20-Feb-15

**Project:** Siltronic / 8128.01.08/08

**Lab ID:** 1502132-001

Analyses	Result	RL	Qual Unit	DF	Date Analyzed
VOLATILE ORGANICS BY GC/MS	;	SW8260B			Analyst: <b>CK</b>
1,2-Dichlorobenzene	ND	1.00	μg/L	1	2/18/2015 6:58:00 PM
1,2-Dichloroethane	ND	1.00	μg/L	1	2/18/2015 6:58:00 PM
1,2-Dichloropropane	ND	1.00	μg/L	1	2/18/2015 6:58:00 PM
1,3,5-Trimethylbenzene	44.0	1.00	μg/L	1	2/18/2015 6:58:00 PM
1,3-Dichlorobenzene	ND	1.00	μg/L	1	2/18/2015 6:58:00 PM
1,3-Dichloropropane	ND	1.00	μg/L	1	2/18/2015 6:58:00 PM
1,4-Dichlorobenzene	ND	1.00	μg/L	1	2/18/2015 6:58:00 PM
2,2-Dichloropropane	ND	1.00	μg/L	1	2/18/2015 6:58:00 PM
2-Butanone	ND	10.0	μg/L	1	2/18/2015 6:58:00 PM
2-Chlorotoluene	ND	1.00	μg/L	1	2/18/2015 6:58:00 PM
2-Hexanone	ND	10.0	μg/L	1	2/18/2015 6:58:00 PM
4-Chlorotoluene	ND	1.00	μg/L	1	2/18/2015 6:58:00 PM
4-Isopropyltoluene	ND	1.00	μg/L	1	2/18/2015 6:58:00 PM
4-Methyl-2-pentanone	ND	20.0	μg/L	1	2/18/2015 6:58:00 PM
Acetone	ND	50.0	μg/L	1	2/18/2015 6:58:00 PM
Acrylonitrile	ND	5.00	μg/L	1	2/18/2015 6:58:00 PM
Benzene	333	3.00	μg/L	10	2/18/2015 5:53:00 PM
Bromobenzene	ND	1.00	μg/L	1	2/18/2015 6:58:00 PM
Bromochloromethane	ND	1.00	μg/L	1	2/18/2015 6:58:00 PM
Bromodichloromethane	ND	1.00	μg/L	1	2/18/2015 6:58:00 PM
Bromoform	ND	1.00	μg/L	1	2/18/2015 6:58:00 PM
Bromomethane	ND	1.00	μg/L	1	2/18/2015 6:58:00 PM
Carbon disulfide	ND	2.00	μg/L	1	2/18/2015 6:58:00 PM
Carbon tetrachloride	ND	1.00	μg/L	1	2/18/2015 6:58:00 PM
Chlorobenzene	ND	1.00	μg/L	1	2/18/2015 6:58:00 PM
Chloroethane	ND	1.00	μg/L	1	2/18/2015 6:58:00 PM
Chloroform	7.14	1.00	μg/L	1	2/18/2015 6:58:00 PM
Chloromethane	ND	1.00	μg/L	1	2/18/2015 6:58:00 PM
cis-1,2-Dichloroethene	12.4	1.00	μg/L	1	2/18/2015 6:58:00 PM
cis-1,3-Dichloropropene	ND	1.00	μg/L	1	2/18/2015 6:58:00 PM
Dibromochloromethane	ND	1.00	μg/L	1	2/18/2015 6:58:00 PM
Dibromomethane	ND	1.00	μg/L	1	2/18/2015 6:58:00 PM
Dichlorodifluoromethane	ND	1.00	μg/L	1	2/18/2015 6:58:00 PM
Ethylbenzene	374	10.0	μg/L	10	2/18/2015 5:53:00 PM
Hexachlorobutadiene	ND	1.00	μg/L	1	2/18/2015 6:58:00 PM
Isopropylbenzene	18.0	1.00	μg/L	1	2/18/2015 6:58:00 PM
m,p-Xylene	334	20.0	μg/L	10	2/18/2015 5:53:00 PM
Methyl tert-butyl ether	ND	1.00	μg/L	1	2/18/2015 6:58:00 PM
Methylene chloride	ND	20.0	μg/L	1	2/18/2015 6:58:00 PM

CLIENT: Maul Foster & Alongi Collection Date: 2/12/2015 4:30:00 PM

**Date Reported:** 

20-Feb-15

**Project:** Siltronic / 8128.01.08/08

**Lab ID:** 1502132-001

Analyses	Result	RL	Qual Unit	DF	Date Analyzed
VOLATILE ORGANICS BY GC/MS	;	SW8260B			Analyst: <b>CK</b>
Naphthalene	11000	100	μg/L	100	2/18/2015 1:56:00 PM
n-Butylbenzene	1.38	1.00	μg/L	1	2/18/2015 6:58:00 PM
n-Propylbenzene	7.16	1.00	μg/L	1	2/18/2015 6:58:00 PM
o-Xylene	166	10.0	μg/L	10	2/18/2015 5:53:00 PM
sec-Butylbenzene	ND	1.00	μg/L	1	2/18/2015 6:58:00 PM
Styrene	ND	1.00	μg/L	1	2/18/2015 6:58:00 PM
tert-Butylbenzene	ND	1.00	μg/L	1	2/18/2015 6:58:00 PM
Tetrachloroethene	ND	1.00	μg/L	1	2/18/2015 6:58:00 PM
Toluene	37.3	1.00	μg/L	1	2/18/2015 6:58:00 PM
trans-1,2-Dichloroethene	ND	1.00	μg/L	1	2/18/2015 6:58:00 PM
trans-1,3-Dichloropropene	ND	1.00	μg/L	1	2/18/2015 6:58:00 PM
Trichloroethene	ND	1.00	μg/L	1	2/18/2015 6:58:00 PM
Trichlorofluoromethane	ND	1.00	μg/L	1	2/18/2015 6:58:00 PM
Vinyl chloride	ND	1.00	μg/L	1	2/18/2015 6:58:00 PM
Surr: 1,2-Dichloroethane-d4	101	85.3-116	%REC	1	2/18/2015 6:58:00 PM
Surr: 4-Bromofluorobenzene	97.8	88.1-120	%REC	1	2/18/2015 6:58:00 PM
Surr: Dibromofluoromethane	98.9	94.2-122	%REC	1	2/18/2015 6:58:00 PM
Surr: Toluene-d8	90.4	86.2-135	%REC	1	2/18/2015 6:58:00 PM
CYANIDE, TOTAL	1	E335.4			Analyst: <b>EFH</b>
Cyanide	0.131	0.0100	mg/L	1	2/18/2015 8:33:08 AM

WO#:

1502132

20-Feb-15

**Specialty Analytical** 

**Client:** 

Maul Foster & Alongi

**Project:** Siltronic / 8128.01.08/08 **TestCode: 6020\_TCLP** 

Sample ID: ICV Client ID: ICV	SampType: ICV  Batch ID: 8938		TestCode: 6020_TCLP Units: μg/L TestNo: E1311/6020 SW3010A			Prep Da Analysis Da		15	RunNo: <b>18928</b> SeqNo: <b>251085</b>		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	49.6	0.100	50.00	0	99.1	90	110				
Barium, TCLP	47.9	1.00	50.00	0	95.7	90	110				
Cadmium, TCLP	47.9	0.100	50.00	0	95.8	90	110				
Chromium, TCLP	50.2	0.100	50.00	0	100	90	110				
Lead, TCLP	47.8	0.100	50.00	0	95.6	90	110				
Selenium, TCLP	52.1	1.00	50.00	0	104	90	110				
Silver, TCLP	47.8	0.100	50.00	0	95.6	90	110				

Sample ID: CCV	SampType: CCV	TestCode: 6020_TCLP Units: µg/L				Prep Da	te:		RunNo: 18928		
Client ID: CCV	Batch ID: 8938	TestN	lo: <b>E1311/602</b> 0	0 SW3010A		Analysis Da	te: <b>2/18/20</b>	15	SeqNo: <b>251</b>	087	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	48.7	0.100	50.00	0	97.5	90	110				
Barium, TCLP	48.9	1.00	50.00	0	97.8	90	110				
Cadmium, TCLP	50.0	0.100	50.00	0	100	90	110				
Chromium, TCLP	49.9	0.100	50.00	0	99.7	90	110				
Lead, TCLP	49.9	0.100	50.00	0	99.7	90	110				
Selenium, TCLP	47.5	1.00	50.00	0	95.0	90	110				
Silver, TCLP	50.1	0.100	50.00	0	100	90	110				

Qualifiers: B Analyte detected in the associated Method Blank

Н

Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

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WO#:

1502132

20-Feb-15

**Specialty Analytical** 

Client: Maul Foster & Alongi

**Project:** Siltronic / 8128.01.08/08 **TestCode: 6020\_TCLP** 

Sample ID: MB-8938 Client ID: PBW	SampType: MBLK  Batch ID: 8938		Code: 6020_TCLP			Prep Da	te: <b>2/17/20</b>	RunNo: <b>189</b> SeqNo: <b>25</b> 1			
CHOIR ID.	Baton IB. Coo	10011	0. 21011/002	0 01100107		7 il lalyolo Da	2,10,20		004110. 20	.000	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	ND	0.100									
Barium, TCLP	ND	1.00									
Cadmium, TCLP	ND	0.100									
Chromium, TCLP	ND	0.100									
Lead, TCLP	ND	0.100									
Selenium, TCLP	ND	1.00									
Silver, TCLP	ND	0.100									

Sample ID: LCS-8938	SampType: LCS	TestCode: 6020_TCLP Units: μg/L				Prep Da	te: <b>2/17/20</b>	15	RunNo: <b>18928</b>		
Client ID: LCSW	Batch ID: 8938	TestN	lo: <b>E1311/602</b>	0 SW3010A	Analysis Date: 2/18/2015			SeqNo: <b>251</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	45.8	0.100	50.00	0	91.6	80	120				
Barium, TCLP	50.5	1.00	50.00	0	101	80	120				
Cadmium, TCLP	50.3	0.100	50.00	0	101	80	120				
Chromium, TCLP	46.5	0.100	50.00	0	93.1	80	120				
Lead, TCLP	50.3	0.100	50.00	0	101	80	120				
Selenium, TCLP	44.5	1.00	50.00	0	88.9	80	120				
Silver, TCLP	51.0	0.100	50.00	0	102	80	120				

Qualifiers: B Analyte detected in the associated Method Blank

R RPD outside accepted recovery limits

Η

Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

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WO#: **1502132** 

20-Feb-15

#### **Specialty Analytical**

**Client:** 

Maul Foster & Alongi

**Project:** Siltronic / 8128.01.08/08 **TestCode: 6020\_TCLP** 

Sample ID: A1502141-001BDUP	SampType: <b>DUP</b>		le: <b>6020_TCL</b>			•	te: <b>2/17/20</b>		RunNo: 189		
Client ID: ZZZZZZ	Batch ID: <b>8938</b>	TestN	lo: <b>E1311/602</b>	0 SW3010A		Analysis Da	te: <b>2/18/20</b>	15	SeqNo: <b>25</b> 1	1093	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	30.4	0.100						30.72	1.15	20	
Barium, TCLP	23.6	1.00						32.63	32.2	20	R
Cadmium, TCLP	ND	0.100						0	0	20	
Chromium, TCLP	ND	0.100						0.1058	200	20	RF
Lead, TCLP	0.115	0.100						0.1273	10.4	20	
Selenium, TCLP	ND	1.00						0	0	20	
Silver, TCLP	ND	0.100						0	0	20	

Sample ID: ICV	SampType: ICV	TestCod	de: <b>6020_TCLI</b>	P Units: μg/L		Prep Da	te:		RunNo: 189	)28	
Client ID: ICV	Batch ID: 8938	TestNo: <b>E1311/6020 SW3010A</b>			Analysis Date: 2/19/2015				SeqNo: <b>251363</b>		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	49.1	0.100	50.00	0	98.1	90	110				
Barium, TCLP	48.5	1.00	50.00	0	97.1	90	110				
Cadmium, TCLP	48.5	0.100	50.00	0	97.0	90	110				
Chromium, TCLP	47.8	0.100	50.00	0	95.7	90	110				
Lead, TCLP	47.5	0.100	50.00	0	95.0	90	110				
Selenium, TCLP	49.1	1.00	50.00	0	98.2	90	110				
Silver, TCLP	47.0	0.100	50.00	0	94.0	90	110				

Qualifiers: B Analyte detected in the associated Method Blank

R RPD outside accepted recovery limits

Η

Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

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S Spike Recovery outside accepted recove

WO#: **1502132** 

20-Feb-15

#### **Specialty Analytical**

Client: Maul Foster & Alongi

**Project:** Siltronic / 8128.01.08/08 **TestCode: 6020\_TCLP** 

Sample ID: A1502141-001BMS Client ID: ZZZZZZ	SampType: MS Batch ID: 8938		de: 6020_TCLI lo: E1311/602		Prep Date: <b>2/17/2015</b> Analysis Date: <b>2/19/2015</b>			RunNo: <b>189</b> SeqNo: <b>251</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	78.2	0.100	50.00	30.72	94.9	70	130				
Barium, TCLP	70.7	1.00	50.00	32.63	76.2	70	130				
Cadmium, TCLP	48.7	0.100	50.00	0.01392	97.4	70	130				
Chromium, TCLP	44.7	0.100	50.00	0.1058	89.2	70	130				
Lead, TCLP	48.8	0.100	50.00	0.1273	97.3	70	130				
Selenium, TCLP	44.4	1.00	50.00	0	88.8	70	130				
Silver, TCLP	47.3	0.100	50.00	0	94.7	70	130				

Sample ID: A1502141-001BMSD	SampType: <b>MSD</b>	TestCod	de: <b>6020_TCL</b>	P Units: μg/L		Prep Da	te: <b>2/17/20</b>	15	RunNo: 189	928	
Client ID: ZZZZZZ	Batch ID: 8938	TestN	No: <b>E1311/602</b>	0 SW3010A		Analysis Da	te: <b>2/19/20</b>	15	SeqNo: <b>25</b> 1	1369	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	76.7	0.100	50.00	30.72	92.0	70	130	78.16	1.86	20	
Barium, TCLP	68.5	1.00	50.00	32.63	71.8	70	130	70.72	3.17	20	
Cadmium, TCLP	48.1	0.100	50.00	0.01392	96.3	70	130	48.71	1.18	20	
Chromium, TCLP	43.4	0.100	50.00	0.1058	86.6	70	130	44.73	3.02	20	
Lead, TCLP	47.2	0.100	50.00	0.1273	94.1	70	130	48.78	3.33	20	
Selenium, TCLP	44.4	1.00	50.00	0	88.8	70	130	44.38	0.0225	20	
Silver, TCLP	46.6	0.100	50.00	0	93.2	70	130	47.33	1.58	20	

Qualifiers: B Analyte detected in the associated Method Blank

R RPD outside accepted recovery limits

Η

Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

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O RSD is greater than RSDlimit

S Spike Recovery outside accepted recove

WO#:

1502132

20-Feb-15

**Specialty Analytical** 

**Client:** 

Maul Foster & Alongi

**Project:** Siltronic / 8128.01.08/08 **TestCode: 6020\_TCLP** 

Sample ID: CCV Client ID: CCV	SampType: CCV Batch ID: 8938		TestCode: 6020_TCLP Units: μg/L TestNo: E1311/6020 SW3010A			Prep Date: Analysis Date: 2/19/2015				RunNo: <b>18928</b> SeqNo: <b>251373</b>		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Arsenic, TCLP	48.4	0.100	50.00	0	96.7	90	110					
Barium, TCLP	49.5	1.00	50.00	0	99.1	90	110					
Cadmium, TCLP	49.4	0.100	50.00	0	98.7	90	110					
Chromium, TCLP	46.9	0.100	50.00	0	93.9	90	110					
Lead, TCLP	48.7	0.100	50.00	0	97.4	90	110					
Selenium, TCLP	47.7	1.00	50.00	0	95.4	90	110					
Silver, TCLP	47.9	0.100	50.00	0	95.8	90	110					

Sample ID: CCV	SampType: CCV	TestCod	de: <b>6020_TCLI</b>	P Units: μg/L		Prep Da	te:		RunNo: 189	)28	
Client ID: CCV	Batch ID: 8938	TestN	lo: <b>E1311/602</b> 0	0 SW3010A	Analysis Date: 2/19/2015			15	SeqNo: <b>251384</b>		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, TCLP	49.1	0.100	50.00	0	98.2	90	110				
Barium, TCLP	49.8	1.00	50.00	0	99.6	90	110				
Cadmium, TCLP	49.9	0.100	50.00	0	99.7	90	110				
Chromium, TCLP	47.8	0.100	50.00	0	95.7	90	110				
Lead, TCLP	48.6	0.100	50.00	0	97.2	90	110				
Selenium, TCLP	49.6	1.00	50.00	0	99.1	90	110				
Silver, TCLP	48.2	0.100	50.00	0	96.4	90	110				

Qualifiers: B Analyte detected in the associated Method Blank

R RPD outside accepted recovery limits

Η

Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

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WO#:

1502132

20-Feb-15

### **Specialty Analytical**

Maul Foster & Alongi **Client:** 

Project: Siltronic / 8	3128.01.08/08						Т	'estCode: 8	3260_W		
Sample ID: CCV MSVWS-2015	SampType: CCV	TestCoo	le: <b>8260_W</b>	Units: µg/L		Prep Da	te:		RunNo: 189	932	
Client ID: CCV	Batch ID: R18932	TestN	lo: <b>SW8260B</b>			Analysis Da	te: <b>2/18/20</b>	15	SeqNo: <b>25</b> 1	1211	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	34.3	1.00	40.00	0	85.9	80	120				
1,2-Dichloropropane	38.4	1.00	40.00	0	96.1	80	120				
Chloroform	35.2	1.00	40.00	0	88.1	80	120				
Ethylbenzene	39.6	1.00	40.00	0	99.1	80	120				
Toluene	39.5	1.00	40.00	0	98.8	80	120				
Vinyl chloride	38.1	1.00	40.00	0	95.3	80	120				
Sample ID: LCS MSVWS-2016	SampType: <b>LCS</b>	TestCoo	le: <b>8260_W</b>	Units: µg/L		Prep Da	te:		RunNo: 189	932	
Client ID: LCSW	Batch ID: <b>R18932</b>	TestN	lo: <b>SW8260B</b>			Analysis Da	te: <b>2/18/20</b>	15	SeqNo: <b>25</b> 1	212	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	42.1	1.00	40.00	0	105	61.2	135				
Benzene	46.2	0.300	40.00	0	116	76.8	125				
Chlorobenzene	46.8	1.00	40.00	0	117	84.1	126				
Toluene	46.6	1.00	40.00	0	116	82	122				
Trichloroethene	41.5	1.00	40.00	0	104	68.5	124				
Sample ID: <b>1502132-001EMS</b>	SampType: <b>MS</b>	TestCoo	le: <b>8260_W</b>	Units: µg/L		Prep Da	te:		RunNo: 189	)32	
Client ID: TOTES-COMP-W	Batch ID: R18932	TestN	lo: <b>SW8260B</b>			Analysis Da	te: <b>2/18/20</b>	15	SeqNo: <b>25</b> 1	1213	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	3670	100	4000	0	91.8	47.8	165				
Benzene	4650	30.0	4000	345.0	108	74.1	136				
Qualifiers: B Analyte detect	ed in the associated Method Bl	ank	H Holdin	g times for preparation	n or analysis	exceeded	ND I	Not Detected at the	e Reporting Limi	t Pa	ge 6 o
O RSD is greater	r than RSDlimit		R RPD o	utside accepted recove	ery limits		S S	Spike Recovery ou	itside accepted re		

WO#:

1502132

20-Feb-15

Specialty	' Analy	tical
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Client:	Maul Foster & Alongi		
Project:	Siltronic / 8128.01.08/08	TestCode:	8260_W

Project: Siltronic / 81	128.01.08/08						Т	CestCode: 8	260_W		
Sample ID: 1502132-001EMS Client ID: TOTES-COMP-W	SampType: MS Batch ID: R18932		de: <b>8260_W</b> do: <b>SW8260B</b>	Units: µg/L		Prep Da Analysis Da		15	RunNo: <b>189</b> SeqNo: <b>251</b>		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chlorobenzene	4480	100	4000	0	112	70.7	133				
Toluene	4530	100	4000	75.00	111	68.4	135				
Trichloroethene	4210	100	4000	0	105	50.8	164				
Sample ID: 1502132-001EMSD	SampType: MSD	TestCoo	de: <b>8260_W</b>	Units: µg/L		Prep Da	te:		RunNo: 189	)32	
Client ID: TOTES-COMP-W	Batch ID: <b>R18932</b>	TestN	lo: <b>SW8260B</b>			Analysis Da	te: <b>2/18/20</b>	15	SeqNo: <b>251</b>	1214	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	4330	100	4000	0	108	47.8	165	3670	16.4	20	
Benzene	4990	30.0	4000	345.0	116	74.1	136	4652	6.95	20	
Chlorobenzene	4720	100	4000	0	118	70.7	133	4478	5.22	20	
Toluene	4690	100	4000	75.00	115	68.4	135	4531	3.38	20	
Trichloroethene	4170	100	4000	0	104	50.8	164	4207	0.883	20	
Sample ID: MB	SampType: MBLK	TestCoo	de: <b>8260_W</b>	Units: µg/L		Prep Da	te:		RunNo: 189	)32	
Client ID: PBW	Batch ID: R18932	TestN	lo: <b>SW8260B</b>			Analysis Da	te: <b>2/18/20</b>	15	SeqNo: <b>251</b>	1215	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	1.00									
1,1,1-Trichloroethane	ND	1.00									
1,1,2,2-Tetrachloroethane	ND	1.00									
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	1.00									
1,1,2-Trichloroethane	ND	1.00									

Qualifiers: B Analyte detected in the associated Method Blank

R RPD outside accepted recovery limits

Holding times for preparation or analysis exceeded

Н

ND Not Detected at the Reporting Limit

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O RSD is greater than RSDlimit

S Spike Recovery outside accepted recove

WO#:

1502132

20-Feb-15

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**Specialty Analytical** 

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

Analyte detected in the associated Method Blank

RSD is greater than RSDlimit

Qualifiers:

TestCode: 8260\_W

ND Not Detected at the Reporting Limit

Spike Recovery outside accepted recove

Sample ID: MB	SampType: MBLK	TestCod	e: <b>8260_W</b>	Units: µg/L	<u> </u>	Prep Da	nte:		RunNo: 189	32	
Client ID: PBW	Batch ID: R18932	TestNo	o: <b>SW8260B</b>			Analysis Da	ate: <b>2/18/2</b> 0	15	SeqNo: <b>251</b>	215	
Apolisto	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	∐iahl imit	RPD Ref Val	%RPD	RPDLimit	Qual
Analyte	Result	FQL	SPK value	SFR Rei Vai	%KEC	LOWLITTII	HIGHLIIIII	KFD Kei vai	76KPD	KPDLIIIII	Quai
1,1-Dichloroethane	ND	1.00									
1,1-Dichloroethene	ND	1.00									
1,1-Dichloropropene	ND	1.00									
1,2,3-Trichlorobenzene	ND	1.00									
1,2,3-Trichloropropane	ND	1.00									
1,2,4-Trichlorobenzene	ND	1.00									
1,2,4-Trimethylbenzene	ND	1.00									
1,2-Dibromo-3-chloropropane	ND	1.00									
1,2-Dibromoethane	ND	1.00									
1,2-Dichlorobenzene	ND	1.00									
1,2-Dichloroethane	ND	1.00									
1,2-Dichloropropane	ND	1.00									
1,3,5-Trimethylbenzene	ND	1.00									
1,3-Dichlorobenzene	ND	1.00									
1,3-Dichloropropane	ND	1.00									
1,4-Dichlorobenzene	ND	1.00									
2,2-Dichloropropane	ND	1.00									
2-Butanone	ND	10.0									
2-Chlorotoluene	ND	1.00									
2-Hexanone	ND	10.0									
4-Chlorotoluene	ND	1.00									
4-Isopropyltoluene	ND	1.00									
4-Methyl-2-pentanone	ND	20.0									
Acetone	ND	50.0									
Acrylonitrile	ND	5.00									
Benzene	ND	0.300									

Holding times for preparation or analysis exceeded

RPD outside accepted recovery limits

WO#:

1502132

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#### **Specialty Analytical**

Maul Foster & Alongi **Client: Project:** Siltronic / 8128.01.08/08

TestCode: 8260\_W

Sample ID: MB	SampType: MBLK	TestCode: 820	60_W	Units: µg/L		Prep Da	te:		RunNo: 189	32	
Client ID: PBW	Batch ID: R18932	TestNo: SV	/8260B			Analysis Da	te: <b>2/18/2</b> 0	15	SeqNo: <b>25</b> 1	215	
Analyte	Result	PQL SP	K value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Bromobenzene	ND	1.00									
Bromochloromethane	ND	1.00									
Bromodichloromethane	ND	1.00									
Bromoform	ND	1.00									
Bromomethane	ND	1.00									
Carbon disulfide	ND	2.00									
Carbon tetrachloride	ND	1.00									
Chlorobenzene	ND	1.00									
Chloroethane	ND	1.00									
Chloroform	ND	1.00									
Chloromethane	ND	1.00									
cis-1,2-Dichloroethene	ND	1.00									
cis-1,3-Dichloropropene	ND	1.00									
Dibromochloromethane	ND	1.00									
Dibromomethane	ND	1.00									
Dichlorodifluoromethane	ND	1.00									
Ethylbenzene	ND	1.00									
Hexachlorobutadiene	ND	1.00									
Isopropylbenzene	ND	1.00									
m,p-Xylene	ND	2.00									
Methyl tert-butyl ether	ND	1.00									
Methylene chloride	ND	20.0									
Naphthalene	ND	1.00									
n-Butylbenzene	ND	1.00									
n-Propylbenzene	ND	1.00									
o-Xylene	ND	1.00									

Qualifiers:

Spike Recovery outside accepted recove

Holding times for preparation or analysis exceeded

Analyte detected in the associated Method Blank

ND Not Detected at the Reporting Limit

WO#:

1502132

20-Feb-15

**Specialty Analytical** 

**Client:** 

Maul Foster & Alongi

Siltronic / 8128.01.08/08 **Project:** TestCode: 8260\_W

Sample ID: MB	SampType: MBLK	TestCode: 8260_W	Units: µg/L		Prep Date	e:		RunNo: 189	32	
Client ID: PBW	Batch ID: <b>R18932</b>	TestNo: SW8260B		Α	nalysis Date	e: <b>2/18/20</b>	15	SeqNo: <b>251</b>	215	
Analyte	Result	PQL SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
sec-Butylbenzene	ND	1.00								
Styrene	ND	1.00								
tert-Butylbenzene	ND	1.00								
Tetrachloroethene	ND	1.00								
Toluene	ND	1.00								
trans-1,2-Dichloroethene	ND	1.00								
trans-1,3-Dichloropropene	ND	1.00								
Trichloroethene	ND	1.00								
Trichlorofluoromethane	ND	1.00								
Vinyl chloride	ND	1.00								
Surr: 1,2-Dichloroethane-d4	104	100.0		104	85.3	116				
Surr: 4-Bromofluorobenzene	93.3	100.0		93.3	88.1	120				
Surr: Dibromofluoromethane	100	100.0		100	94.2	122				
Surr: Toluene-d8	101	100.0		101	86.2	135				

Η

Holding times for preparation or analysis exceeded

WO#:

1502132

20-Feb-15

#### **Specialty Analytical**

**Client:** Maul Foster & Alongi Droject. Siltronic / 8128 01 08/08

O RSD is greater than RSDlimit

ToctCodo 9270TT W

S Spike Recovery outside accepted recove

Sample ID: CCV-8934	SampType: CCV	TestCoo	le: <b>8270LL_W</b>	Units: µg/L		Prep Date:			RunNo: <b>189</b>	004	
Client ID: CCV	Batch ID: 8934	TestN	lo: <b>SW8270D</b>	SW 3510C		Analysis Date:	2/17/20	15	SeqNo: <b>250</b>	505	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit F	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qua
1,2,4-Trichlorobenzene	40.2	1.00	40.00	0	101	80	120				
1,2-Diphenylhydrazine	42.4	5.00	40.00	0	106	80	120				
1,4-Dichlorobenzene	36.8	1.00	40.00	0	92.0	80	120				
2,3,5,6-Tetrachlorophenol	42.4	5.00	40.00	0	106	80	120				
2,4,6-Trichlorophenol	43.8	5.00	40.00	0	110	80	120				
2,4-Dichlorophenol	42.6	3.00	40.00	0	107	80	120				
2-Nitrophenol	44.0	5.00	40.00	0	110	80	120				
4-Chloro-3-methylphenol	45.6	2.00	40.00	0	114	80	120				
Acenaphthene	45.9	1.00	40.00	0	115	80	120				
Benzo(a)pyrene	47.6	1.00	40.00	0	119	80	120				
Di-n-octyl phthalate	46.9	1.00	40.00	0	117	80	120				
Fluoranthene	44.8	1.00	40.00	0	112	80	120				
Hexachlorobutadiene	41.3	2.00	40.00	0	103	80	120				
N-Nitrosodiphenylamine	42.8	1.00	40.00	0	107	80	120				
Pentachlorophenol	34.9	5.00	40.00	0	87.3	80	120				
Phenol	47.2	2.00	40.00	0	118	80	120				
Sample ID: LCS-8934	SampType: <b>LCS</b>	TestCoo	le: <b>8270LL_W</b>	Units: µg/L		Prep Date:	2/16/20	15	RunNo: 189	004	
Client ID: LCSW	Batch ID: 8934	TestN	lo: <b>SW8270D</b>	SW 3510C		Analysis Date:	2/17/20	15	SeqNo: 250	506	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit H	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qua
1,2,4-Trichlorobenzene	30.1	1.00	50.00	0	60.3	42.4	104				
1,4-Dichlorobenzene	31.3	1.00	50.00	0	62.6	37.9	105				
2,4-Dinitrotoluene	38.4	5.00	50.00	0	76.9	52.9	133				

RPD outside accepted recovery limits

1502132 WO#:

20-Feb-15

#### **Specialty Analytical**

Maul Foster & Alongi **Client:** 

**Project:** Siltronic / 8128.01.08/08 TestCode: 8270LL\_W

Sample ID: LCS-8934	SampType: <b>LCS</b>	TestCode: 8270LL_W Units: µg/L			Prep Da	te: <b>2/16/20</b>	15	RunNo: <b>18904</b>			
Client ID: LCSW	Batch ID: 8934	TestN	lo: <b>SW8270D</b>	SW 3510C	Analysis Date: 2/17/2015			SeqNo: <b>250</b>	0506		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
2-Chlorophenol	44.7	1.00	50.00	0	89.4	27.8	118				
4-Chloro-3-methylphenol	48.3	2.00	50.00	0	96.6	33.5	129				
4-Nitrophenol	16.0	5.00	50.00	0	32.0	11.4	49.1				
Acenaphthene	42.1	1.00	50.00	0	84.3	42.4	124				
N-Nitrosodi-n-propylamine	61.9	2.00	50.00	0	124	33.9	138				
Pentachlorophenol	22.3	5.00	50.00	0	44.5	43.3	113				
Phenol	16.7	2.00	50.00	0	33.4	6.73	54.7				
Pyrene	40.3	1.00	50.00	0	80.7	59.4	119				

Sample ID: LCSD-8934	SampType: <b>LCSD</b>	TestCod	de: <b>8270LL_W</b>	Units: µg/L	/L Prep Date: 2/16/2015				RunNo: 189	904	
Client ID: LCSS02	Batch ID: 8934	TestN	lo: <b>SW8270D</b>	SW 3510C		Analysis Da	te: <b>2/17/20</b>	15	SeqNo: <b>250</b>	0507	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2,4-Trichlorobenzene	28.2	1.00	50.00	0	56.5	42.4	104	30.14	6.47	20	
1,4-Dichlorobenzene	28.1	1.00	50.00	0	56.3	37.9	105	31.32	10.7	20	
2,4-Dinitrotoluene	38.8	5.00	50.00	0	77.7	52.9	133	38.45	1.01	20	
2-Chlorophenol	40.4	1.00	50.00	0	80.7	27.8	118	44.69	10.2	20	
4-Chloro-3-methylphenol	48.5	2.00	50.00	0	97.1	33.5	129	48.28	0.516	20	
4-Nitrophenol	22.4	5.00	50.00	0	44.7	11.4	49.1	16.02	33.1	20	R
Acenaphthene	40.2	1.00	50.00	0	80.4	42.4	124	42.14	4.76	20	
N-Nitrosodi-n-propylamine	58.0	2.00	50.00	0	116	33.9	138	61.87	6.51	20	
Pentachlorophenol	25.4	5.00	50.00	0	50.9	43.3	113	22.27	13.2	20	
Phenol	17.6	2.00	50.00	0	35.1	6.73	54.7	16.71	4.90	20	
Pyrene	38.9	1.00	50.00	0	77.9	59.4	119	40.33	3.53	20	

Analyte detected in the associated Method Blank Qualifiers:

RPD outside accepted recovery limits

Η

Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

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Spike Recovery outside accepted recove

SeqNo: 250507

WO#:

1502132

20-Feb-15

**Specialty Analytical** 

Client ID:

Maul Foster & Alongi **Client:** 

Batch ID: 8934

Siltronic / 8128.01.08/08 TestCode: 8270LL\_W **Project:** 

TestNo: SW8270D

Sample ID: LCSD-8934 SampType: LCSD TestCode: 8270LL\_W Units: µg/L Prep Date: 2/16/2015 RunNo: 18904 LCSS02

SW 3510C LowLimit HighLimit RPD Ref Val Analyte Result **PQL** SPK value SPK Ref Val %REC %RPD **RPDLimit** Qual

Analysis Date: 2/17/2015

Sample ID: MB-8934	SampType: <b>MBLK</b>	TestCode: 8270LL	_W Units: μg/L		Prep Date	e: <b>2/16/2</b> 0	15	RunNo: 189	904	
Client ID: PBW	Batch ID: 8934	TestNo: SW8270	DD SW 3510C		Analysis Date	e: <b>2/17/2</b> 0	15	SeqNo: <b>250</b>	508	
Analyte	Result	PQL SPK valu	e SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2,4-Trichlorobenzene	ND	1.00								
1,2-Dichlorobenzene	ND	1.00								
1,2-Diphenylhydrazine	ND	5.00								
1,3-Dichlorobenzene	ND	1.00								
1,4-Dichlorobenzene	ND	1.00								
1-Methylnaphthalene	ND	1.00								
2,3,4-Trichlorophenol	ND	1.00								
2,3,5,6-Tetrachlorophenol	ND	5.00								
2,3,5-Trichlorophenol	ND	1.00								
2,3,6-Trichlorophenol	ND	1.00								
2,4,5-Trichlorophenol	ND	5.00								
2,4,6-Trichlorophenol	ND	5.00								
2,4-Dichlorophenol	ND	3.00								
2,4-Dimethylphenol	ND	1.00								
2,4-Dinitrophenol	ND	10.0								
2,4-Dinitrotoluene	ND	5.00								
2,6-Dinitrotoluene	ND	5.00								
2-Chloronaphthalene	ND	1.00								
2-Chlorophenol	ND	1.00								

Qualifiers: Analyte detected in the associated Method Blank

RPD outside accepted recovery limits

Holding times for preparation or analysis exceeded

Η

Not Detected at the Reporting Limit

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RSD is greater than RSDlimit

Spike Recovery outside accepted recove

WO#:

1502132

20-Feb-15

**Specialty Analytical** 

**Client:** 

Maul Foster & Alongi

**Project:** Siltronic / 8128.01.08/08 **TestCode: 8270LL\_W** 

Sample ID: MB-8934	SampType: MBLK		de: <b>8270LL_W</b>						RunNo: 189		
Client ID: PBW	Batch ID: <b>8934</b>	I estN	lo: <b>SW8270D</b>	SW 3510C		Analysis Da	ate: <b>2/17/2</b> 0	)15	SeqNo: <b>250</b>	)508	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
2-Methylnaphthalene	ND	1.00									
2-Methylphenol	ND	2.00									
2-Nitroaniline	ND	5.00									
2-Nitrophenol	ND	5.00									
3-&4-Methylphenol	ND	10.0									
3,3'-Dichlorobenzidine	ND	5.00									
3-Nitroaniline	ND	6.00									
4,6-Dinitro-2-methylphenol	ND	10.0									
4-Bromophenyl phenyl ether	ND	1.00									
4-Chloro-3-methylphenol	ND	2.00									
4-Chloroaniline	ND	3.00									
4-Chlorophenyl phenyl ether	ND	1.00									
4-Nitroaniline	ND	5.00									
4-Nitrophenol	ND	5.00									
Acenaphthene	ND	1.00									
Acenaphthylene	ND	1.00									
Anthracene	ND	1.00									
Benz(a)anthracene	ND	1.00									
Benzo(a)pyrene	ND	1.00									
Benzo(b)fluoranthene	ND	1.00									
Benzo(g,h,i)perylene	ND	1.00									
Benzo(k)fluoranthene	ND	1.00									
Benzoic Acid	ND	20.0									
Benzyl Alcohol	ND	5.00									
Bis(2-chloroethoxy)methane	ND	1.00									
Bis(2-chloroethyl)ether	ND	2.00									

Qualifiers:

Analyte detected in the associated Method Blank

RSD is greater than RSDlimit

Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

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1502132 WO#:

20-Feb-15

#### **Specialty Analytical**

Maul Foster & Alongi **Client:** 

**Project:** Siltronic / 8128.01.08/08 TestCode: 8270LL\_W

Sample ID: MB-8934 Client ID: PBW	SampType: <b>MBLK</b> Batch ID: <b>8934</b>		: 8270LL_W : SW8270D	Units: µg/L SW 3510C		Prep Da Analysis Da	te: 2/16/20		RunNo: <b>189</b> SeqNo: <b>250</b>		
Client ID. PDW	Dalch ID. <b>0934</b>	I ESTINO	. 3W0Z/UD	3W 3510C		Allalysis Da	ne. 2/1//20	715	3eq110. <b>23</b> 0	J306	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Bis(2-chloroisopropyl)ether	ND	1.00									
Bis(2-ethylhexyl)phthalate	ND	1.00									
Butyl benzyl phthalate	ND	1.00									
Carbazole	ND	1.00									
Chrysene	ND	1.00									
Dibenz(a,h)anthracene	ND	1.00									
Dibenzofuran	ND	1.00									
Diethyl phthalate	ND	1.00									
Dimethyl phthalate	ND	1.00									
Di-n-butyl phthalate	ND	1.00									
Di-n-octyl phthalate	ND	1.00									
Fluoranthene	ND	1.00									
Fluorene	ND	1.00									
Hexachlorobenzene	ND	1.00									
Hexachlorobutadiene	ND	2.00									
Hexachlorocyclopentadiene	ND	5.00									
Hexachloroethane	ND	2.00									
Indeno(1,2,3-cd)pyrene	ND	1.00									
Isophorone	ND	1.00									
Naphthalene	ND	1.00									
Nitrobenzene	ND	1.00									
N-Nitrosodimethylamine	ND	1.00									
N-Nitrosodi-n-propylamine	ND	2.00									
N-Nitrosodiphenylamine	ND	1.00									
Pentachlorophenol	ND	5.00									
Phenanthrene	ND	1.00									
Qualifiers: B Analyte detec	cted in the associated Method Bla	nk	H Holdin	g times for preparation	n or analysis	exceeded	ND	Not Detected at the	e Reporting Limi	t Pag	e 15 of 24

Spike Recovery outside accepted recove

Analyte detected in the associated Method Blank

RPD outside accepted recovery limits

ND Not Detected at the Reporting Limit

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WO#: **1502132** 

20-Feb-15

#### **Specialty Analytical**

Client: Maul Foster & Alongi
Project: Siltronic / 8128.01.08/08

TestCode: 8270LL\_W

Sample ID: MB-8934	SampType: <b>MBLK</b>	TestCode: 8270LL_W	Units: μg/L	·			RunNo: <b>18904</b>	
Client ID: PBW	Batch ID: 8934	TestNo: SW8270D	SW 3510C		Analysis Da	te: <b>2/17/2015</b>	SeqNo: <b>250508</b>	
Analyte	Result	PQL SPK value	SPK Ref Val	%REC	LowLimit	HighLimit RPD Ref V	/al %RPD RPDLimit	Qual
Phenol	ND	2.00						
Pyrene	ND	1.00						
Pyridine	ND	5.00						
Surr: 2,4,6-Tribromophenol	48.2	100.0		48.2	33.1	99.7		
Surr: 2-Fluorobiphenyl	38.5	100.0		38.5	33.1	96.2		
Surr: 2-Fluorophenol	27.1	100.0		27.1	13.4	57.1		
Surr: 4-Terphenyl-d14	47.6	100.0		47.6	41	122		
Surr: Nitrobenzene-d5	56.8	100.0		56.8	28.9	99.9		
Surr: Phenol-d6	15.6	100.0		15.6	10.6	38.5		

Η

1502132 WO#:

20-Feb-15

#### **Specialty Analytical**

Client: Project:		Maul Foster & Alongi Siltronic / 8128.01.08/08		TestCode:					CestCode: (	CN_W			
Sample ID:	R18933IC	SampType: IC	CV	TestCoo	le: CN_W	Units: mg/L		Prep Da	te:		RunNo: 189	933	
Client ID:	ICV	Batch ID: R	18933	TestN	lo: <b>E335.4</b>			Analysis Da	te: <b>2/17/2</b> 0	15	SeqNo: <b>25</b> 1	1060	
Analyte		F	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide			0.323	0.0100	0.3000	0	108	90	110				
Sample ID:	R18933IC	SampType: IC	cv	TestCod	le: CN_W	Units: mg/L		Prep Da	te:		RunNo: 189	933	
Client ID:	ICV	Batch ID: R	18933	TestN	lo: <b>E335.4</b>			Analysis Da	te: <b>2/18/2</b> 0	15	SeqNo: <b>25</b> 1	063	
Analyte		F	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide			0.313	0.0100	0.3000	0	104	90	110				
Sample ID:	MB-R189	33 SampType: M	IBLK	TestCod	le: CN_W	Units: mg/L		Prep Da	te:		RunNo: 189	933	
Client ID:	PBW	Batch ID: R	18933	TestN	lo: <b>E335.4</b>			Analysis Da	te: <b>2/18/2</b> 0	15	SeqNo: <b>25</b> 1	1064	
Analyte		F	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide			ND	0.0100									
Sample ID:	LCS-R18	933 SampType: L	cs	TestCod	le: CN_W	Units: mg/L		Prep Da	te:		RunNo: 189	)33	
Client ID:	LCSW	Batch ID: R	18933	TestN	lo: <b>E335.4</b>			Analysis Da	te: <b>2/18/2</b> 0	15	SeqNo: <b>25</b> 1	065	
Analyte		F	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide			0.220	0.0100	0.2000	0	110	80	120				

Qualifiers: Analyte detected in the associated Method Blank

Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

Spike Recovery outside accepted recove

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RSD is greater than RSDlimit

RPD outside accepted recovery limits

Η

WO#:

1502132

20-Feb-15

Maul Foster & Alongi **Client:** 

Project:	Siltronic / 8	3128.01.08/08	TestCo						CestCode: C	CN_W		
Sample ID:	1502119-001BMS ZZZZZZ	SampType: MS  Batch ID: R18933		e: CN_W o: E335.4	Units: mg/L		Prep Dat		15	RunNo: <b>189</b> SeqNo: <b>25</b> 1		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit		RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide		0.151	0.0100	0.1000	0.03410	117	67.9	120				
Sample ID:	1502119-001BMSD	SampType: <b>MSD</b>	TestCod	e: CN_W	Units: mg/L		Prep Dat	te:		RunNo: 189	933	
Client ID:	ZZZZZZ	Batch ID: <b>R18933</b>	TestNo	o: <b>E335.4</b>			Analysis Dat	te: <b>2/18/20</b>	15	SeqNo: 251	1068	
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide		0.147	0.0100	0.1000	0.03410	113	67.9	120	0.1509	2.35	20	
Sample ID:	R18933CCV	SampType: CCV	TestCod	e: CN_W	Units: mg/L		Prep Dat	te:		RunNo: 189	933	
Client ID:	CCV	Batch ID: <b>R18933</b>	TestNo	o: <b>E335.4</b>			Analysis Dat	te: <b>2/18/20</b>	15	SeqNo: <b>25</b> 1	1074	
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Samp	le ID: R18933CCV	SampType: CCV	TestCode: CN_W Units: mg		Units: mg/L		Prep Date:			RunNo: 189		
Client	ID: CCV	Batch ID: <b>R18933</b>	Test	No: <b>E335.4</b>			Analysis Date: 2/18/2015		SeqNo: <b>25</b> 1	1074		
Analy	te	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyani	de	0.363	0.0100	0.3500	0	104	90	110				

RSD is greater than RSDlimit

Η

Spike Recovery outside accepted recove

Holding times for preparation or analysis exceeded

Analyte detected in the associated Method Blank

WO#: **1502132** 

20-Feb-15

#### **Specialty Analytical**

Siltronic   8128.01.08/08   Siltronic   8128.01.08/08   Siltronic   8128.01.08/08   SampType: MBLK   TestCode: HG_CT   Units: mg/L   Prep Date:   2/17/2015   RunNo:   18910   Seq.No:   250577   Seq.No:   250578   Seq.No:					
Sample ID: MB-8944   SampType: MBLK   TestCode: HG_CT   Units: mg/L   Prep Date: 2/17/2015   RunNo: 18910		· ·			TestCode: HG CT
Analyte Result PQL SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Q  Mercury, TCLP ND 0.000100  Sample ID: LCS-8944 SampType: LCS TestCode: HG_CT Units: mg/L Analysis Date: 2/17/2015 RunNo: 18910  Sample ID: LCSW Batch ID: 8944 TestNo: E7470A E245.1 Analysis Date: 2/17/2015 SeqNo: 250578  Analyte Result PQL SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Q  Mercury, TCLP 0.00379 0.000100 0.004000 0 94.7 85.4 116  Sample ID: 1502126-002BMS SampType: MS TestCode: HG_CT Units: mg/L Prep Date: 2/17/2015 SeqNo: 250584  Analyte Result PQL SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Q  Mercury, TCLP 0.00407 0.000100 0.004000 0 102 69.5 125  Sample ID: 1502126-002BMSD SampType: MSD TestCode: HG_CT Units: mg/L Prep Date: 2/17/2015 SeqNo: 250584  Analyte Result PQL SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Q  Mercury, TCLP 0.00407 0.000100 0.004000 0 102 69.5 125  Sample ID: 1502126-002BMSD SampType: MSD TestCode: HG_CT Units: mg/L Prep Date: 2/17/2015 RunNo: 18910  Sample ID: 1502126-002BMSD SampType: MSD TestCode: HG_CT Units: mg/L Prep Date: 2/17/2015 SeqNo: 250585  Analyte Result PQL SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Q  Mercury, TCLP 0.00407 0.000100 0.004000 0 102 69.5 125	Sample ID: MB-8944		_	· ·	Prep Date: 2/17/2015 RunNo: 18910
Mercury, TCLP  ND  0.000100  Sample ID: LCS-8944  SampType: LCS  TestCode: HG_CT  Units: mg/L  Prep Date: 2/17/2015  RunNo: 18910  SeqNo: 250578  Analyte  Result  PQL  SPK value  SPK Ref Val  Mercury, TCLP  0.00379  0.000100  0.004000  0  94.7  85.4  116  Sample ID: 1502126-002BMS  SampType: MS  TestCode: HG_CT  Units: mg/L  Prep Date: 2/17/2015  RunNo: 18910  Run	Client ID: PBW	Batch ID: <b>8944</b>	TestNo: <b>E7470A</b>	E245.1	Analysis Date: <b>2/17/2015</b> SeqNo: <b>250577</b>
Sample ID: LCS-8944 SampType: LCS TestCode: HG_CT Units: mg/L Prep Date: 2/17/2015 RunNo: 18910  Client ID: LCSW Batch ID: 8944 TestNo: E7470A E245.1 Analysis Date: 2/17/2015 Seq.No: 250578  Analyte Result PQL SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Q  Mercury, TCLP 0.00379 0.000100 0.004000 0 94.7 85.4 116  Sample ID: 1502126-002BMS SampType: MS TestCode: HG_CT Units: mg/L Analysis Date: 2/17/2015 Seq.No: 250584  Analyte Result PQL SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Q  Mercury, TCLP 0.00407 0.000100 0.004000 0 102 69.5 125  Sample ID: 1502126-002BMSD SampType: MSD TestCode: HG_CT Units: mg/L Prep Date: 2/17/2015 RunNo: 18910  Sample ID: 1502126-002BMSD SampType: MSD TestCode: HG_CT Units: mg/L Prep Date: 2/17/2015 RunNo: 18910  Sample ID: 1502126-002BMSD SampType: MSD TestCode: HG_CT Units: mg/L Prep Date: 2/17/2015 RunNo: 18910  Sample ID: 1502126-002BMSD SampType: MSD TestCode: HG_CT Units: mg/L Prep Date: 2/17/2015 Seq.No: 250585  Analyte Result PQL SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Q  Manalyte Sexual PQL SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Q  Manalyte Result PQL SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Q  Manalyte Result PQL SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Q	Analyte	Result	PQL SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
Policy   Part   Policy   Part   Policy   Polic	Mercury, TCLP	ND	0.000100		
Analyte Result PQL SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Q wercury, TCLP 0.00379 0.000100 0.004000 0 94.7 85.4 116  Sample ID: 1502126-002BMS SampType: MS TestCode: HG_CT Units: mg/L Prep Date: 2/17/2015 RunNo: 18910 SeqNo: 250584  Analyte Result PQL SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Q wercury, TCLP 0.00407 0.000100 0.004000 0 102 69.5 125  Sample ID: 1502126-002BMSD SampType: MSD TestCode: HG_CT Units: mg/L Prep Date: 2/17/2015 RunNo: 18910 SeqNo: 250585  Analyte Result PQL SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Q Mercury, TCLP 0.00407 0.000100 0.004000 0 102 69.5 125  Sample ID: 1502126-002BMSD SampType: MSD TestCode: HG_CT Units: mg/L Prep Date: 2/17/2015 SeqNo: 250585  Analyte Result PQL SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Q Mercury, TCLP SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Q Mercury Result PQL SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Q Mercury Result PQL SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Q Mercury Result PQL SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Q Mercury Result PQL SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Q Mercury Result PQL SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Q	Sample ID: LCS-8944	9944 SampType: LCS TestCode: HG_CT Units: n		Units: mg/L	Prep Date: <b>2/17/2015</b> RunNo: <b>18910</b>
Mercury, TCLP  0.00379  0.000100  0.004000  0  94.7  85.4  116  Sample ID: 1502126-002BMS  SampType: MS  TestCode: HG_CT  Units: mg/L  Analysis Date: 2/17/2015  SeqNo: 250584  Analyte  Result  PQL  SPK value  SPK Ref Val  Mercury, TCLP  0.00407  0.000100  0.004000  0  102  69.5  125  SampType: MSD  TestCode: HG_CT  Units: mg/L  Prep Date: 2/17/2015  SeqNo: 250584  RPD RPDLimit  Q  Mercury, TCLP  0.00407  0.000100  0.004000  0  102  69.5  125  SampType: MSD  TestCode: HG_CT  Units: mg/L  Prep Date: 2/17/2015  RunNo: 18910  Analysis Date: 2/17/2015  SeqNo: 250585  Analyte  Result  PQL  SPK value  SPK Ref Val  WREC  LowLimit  HighLimit  RPD Ref Val  WRPD  RPDLimit  Q  Republimit  RPD Ref Val  Republimit  Republimi	Client ID: LCSW	Batch ID: 8944	TestNo: E7470A	E245.1	Analysis Date: <b>2/17/2015</b> SeqNo: <b>250578</b>
Sample ID: 1502126-002BMS	Analyte	Result	PQL SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
Client ID:         ZZZZZZZ         Batch ID:         8944         TestNo:         E7470A         E245.1         Analysis Date:         2/17/2015         SeqNo:         250584           Analyte         Result         PQL         SPK value         SPK Ref Val         %REC         LowLimit         HighLimit         RPD Ref Val         %RPD         RPDLimit         Q           Mercury, TCLP         0.00407         0.000100         0.004000         0         102         69.5         125           Sample ID:         1502126-002BMSD         SampType:         MSD         TestCode:         HG_CT         Units:         mg/L         Prep Date:         2/17/2015         RunNo:         18910           Client ID:         ZZZZZZZ         Batch ID:         8944         TestNo:         E7470A         E245.1         Analysis Date:         2/17/2015         SeqNo:         250585           Analyte         Result         PQL         SPK value         SPK Ref Val         %REC         LowLimit         HighLimit         RPD Ref Val         %RPD         RPDLimit         Q	Mercury, TCLP	0.00379	0.000100 0.004000	0	94.7 85.4 116
Analyte Result PQL SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Q Mercury, TCLP 0.00407 0.000100 0.004000 0 102 69.5 125  Sample ID: 1502126-002BMSD SampType: MSD TestCode: HG_CT Units: mg/L Prep Date: 2/17/2015 RunNo: 18910 Client ID: ZZZZZZZ Batch ID: 8944 TestNo: E7470A E245.1 Analysis Date: 2/17/2015 SeqNo: 250585  Analyte Result PQL SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Q	Sample ID: 1502126-0028	BMS SampType: MS	TestCode: HG_CT	Units: mg/L	Prep Date: <b>2/17/2015</b> RunNo: <b>18910</b>
Mercury, TCLP 0.00407 0.000100 0.004000 0 102 69.5 125  Sample ID: 1502126-002BMSD SampType: MSD TestCode: HG_CT Units: mg/L Prep Date: 2/17/2015 RunNo: 18910  Client ID: ZZZZZZ Batch ID: 8944 TestNo: E7470A E245.1 Analysis Date: 2/17/2015 SeqNo: 250585  Analyte Result PQL SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Q	Client ID: ZZZZZZ	Batch ID: 8944	TestNo: E7470A	E245.1	Analysis Date: <b>2/17/2015</b> SeqNo: <b>250584</b>
Sample ID: 1502126-002BMSD SampType: MSD TestCode: HG_CT Units: mg/L Prep Date: 2/17/2015 RunNo: 18910 Client ID: ZZZZZZ Batch ID: 8944 TestNo: E7470A E245.1 Analysis Date: 2/17/2015 SeqNo: 250585  Analyte Result PQL SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Q	Analyte	Result	PQL SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
Client ID: ZZZZZZ Batch ID: 8944 TestNo: E7470A E245.1 Analysis Date: 2/17/2015 SeqNo: 250585  Analyte Result PQL SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Q	Mercury, TCLP	0.00407	0.000100 0.004000	0	102 69.5 125
Analyte Result PQL SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Q	Sample ID: <b>1502126-002E</b>	BMSD SampType: MSD	TestCode: HG_CT	Units: mg/L	Prep Date: <b>2/17/2015</b> RunNo: <b>18910</b>
	Client ID: ZZZZZZ	Batch ID: 8944	TestNo: E7470A	E245.1	Analysis Date: <b>2/17/2015</b> SeqNo: <b>250585</b>
Mercury, TCLP 0.00382 0.000100 0.004000 0 95.5 69.5 125 0.004069 6.31 20	Analyte	Result	PQL SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
	Mercury, TCLP	0.00382	0.000100 0.004000	0	95.5 69.5 125 0.004069 6.31 20

Qualifiers: B Analyte detected in the associated Method Blank

R RPD outside accepted recovery limits

Η

Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

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O RSD is greater than RSDlimit

S Spike Recovery outside accepted recove

WO#: **1502132** 

20-Feb-15

**Specialty Analytical** 

Client: Maul Foster & Alongi

Project: Siltronic / 8128.01.08/08 TestCode: HG\_CT

Sample ID: CCV	SampType: CCV	TestCode: HG_CT	Units: mg/L		Prep Dat	e:		RunNo: <b>18910</b>				
Client ID: CCV	Batch ID: 8944	TestNo: E7470A	E245.1		Analysis Dat	te: <b>2/17/201</b>	SeqNo: <b>250</b>					
Analyte	Result	PQL SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual		
Mercury, TCLP	0.00371	0.000100 0.004000	0	92.8	90	110						

1502132 WO#:

20-Feb-15

**Specialty Analytical** 

Client: Project:		Maul Foster & Alongi Siltronic / 8128.01.08/08					TestCode: NWTPHDXLL_W									
Sample ID:	CCV	SampType: CCV	TestCo	de: <b>NWTPHDX</b>	LL Units: mg/L		Prep Date	):		RunNo: 189	901					
Client ID:	CCV	Batch ID: 8933	TestN	lo: <b>NWTPH-D</b>	x SW3510B		Analysis Date	e: <b>2/16/20</b> ′	15	SeqNo: 250	)464					
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual				
Diesel		6.40	0.0800	6.000	0	107	85	115								
Lube Oil		3.05	0.200	3.000	0	102	85	115								
Sample ID:	MB-89:	33 SampType: MBLK	TestCo	de: <b>NWTPHDX</b>	(LL Units: mg/L		Prep Date	e: 2/16/20°	15	RunNo: 189	901					
Client ID:	PBW	Batch ID: 8933	TestN	lo: <b>NWTPH-D</b>	x SW3510B		Analysis Date	e: <b>2/16/20</b> ′	15	SeqNo: <b>250</b>	)4 <b>6</b> 5					
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual				
Diesel		ND	0.0800													
Lube Oil		ND	0.200													
Surr: o-Te	erphenyl	0.190		0.2000		94.8	50	150								
Sample ID:	LCS-89	933 SampType: LCS	TestCo	de: <b>NWTPHDX</b>	(LL Units: mg/L		Prep Date	e: <b>2/16/20</b> °	15	RunNo: 189	901					
Client ID:	LCSW	Batch ID: <b>8933</b>	TestN	lo: <b>NWTPH-D</b>	x SW3510B		Analysis Date	e: <b>2/16/20</b> °	15	SeqNo: <b>250</b>	0466					
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual				
Diesel	_	0.743	0.0800	1.000	0	74.3	60.7	121				<del></del>				
Lube Oil		0.788	0.200	1.000	0	78.8	64	126								
Sample ID:	LCSD-	8933 SampType: LCSD	TestCo	de: <b>NWTPHDX</b>	(LL Units: mg/L		Prep Date	e: <b>2/16/20</b> °	15	RunNo: 189	901					
Client ID:	LCSS0	Batch ID: 8933	TestN	lo: <b>NWTPH-D</b>	x SW3510B		Analysis Date	e: <b>2/16/20</b> ′	15	SeqNo: <b>250</b>	)467					
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual				

Qualifiers: Analyte detected in the associated Method Blank

RPD outside accepted recovery limits

Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

Page 21 of 24

RSD is greater than RSDlimit

Spike Recovery outside accepted recove

WO#:

1502132

20-Feb-15

**Specialty Analytical** 

**Client:** 

Maul Foster & Alongi

**Project:** Siltronic / 8128.01.08/08 TestCode: NWTPHDXLL\_W

Sample ID: LCSD-8933 Client ID: LCSS02	SampType: LCSD  Batch ID: 8933	TestCode: NWTPHDXLL Units: mg/L TestNo: NWTPH-Dx SW3510B				Prep Date	te: <b>2/16/20</b>		RunNo: <b>18901</b> SeqNo: <b>250467</b>		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Lube Oil	0.737 0.757	0.0800 0.200	1.000 1.000	0 0	73.7 75.7	60.7 64	121 126	0.7431 0.7880	0.862 4.00	20 20	

Sample ID: CCV	SampType: CCV	TestCod	e: <b>NWTPHDX</b>	(LL Units: mg/L		Prep Da	te:		RunNo: 189	01	
Client ID: CCV	Batch ID: 8933	TestN	o: <b>NWTPH-D</b>	x SW3510B		Analysis Da	te: <b>2/16/20</b>	15	SeqNo: <b>250469</b>		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	8.40	0.0800	8.000	0	105	85	115				
Lube Oil	4.39	0.200	4.000	0	110	85	115				

Η

WO#:

1502132

20-Feb-15

Client: Project:	Maul Foster & Alongi Siltronic / 8128.01.08/08						T	TestCode: N	NWTPHGX_	_W		
Sample ID: CCV Client ID: CCV	SampType: <b>C</b> Batch ID: <b>R</b>		de: NWTPHG)	X_W Units: μg/L		Prep Dat Analysis Dat		15	RunNo: <b>18951</b> SeqNo: <b>251422</b>			
Analyte	F	Result PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Gasoline		2010 100	2000	0	100	80	120					
Sample ID: MB-R1				K_W Units: µg/L		Prep Dat	te:		RunNo: <b>18951</b>			
Client ID: PBW	Batch ID: R	18951 Test	No: <b>NWTPH-G</b>	×		Analysis Dat	te: <b>2/19/20</b>	15	SeqNo: <b>25</b> 1	423		
Analyte	F	Result PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Gasoline Surr: 4-Bromofluc	orobenzene	ND 100 110	100.0		110	50	150					
Sample ID: CCV	SampType: <b>C</b>	CV TestCo	de: <b>NWTPHG</b>	K_W Units: µg/L		Prep Dat	te:		RunNo: <b>18951</b>			
Client ID: CCV	Batch ID: R	18951 Test	lo: <b>NWTPH-G</b>	x		Analysis Dat	te: <b>2/19/2</b> 0	15	SeqNo: <b>25</b> 1	432		
Analyte	F	Result PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Gasoline		1990 100	2000	0	99.7	80	120					
Sample ID: CCB	SampType: <b>C</b>	CB TestCo	de: <b>NWTPHG</b>	K_W Units: µg/L		Prep Dat	te:		RunNo: 189	)51		
Client ID: CCB	Batch ID: R	18951 Test	No: NWTPH-G	x		Analysis Dat	te: <b>2/19/20</b>	15	SeqNo: <b>25</b> 1	433		
Analyte	F	Result PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Gasoline Surr: 4-Bromofluo	orobenzene	ND 100 103	100.0		103	50	150					

1502132 WO#:

20-Feb-15

#### **Specialty Analytical**

Gasoline

Qualifiers:

**Client:** Maul Foster & Alongi

2500

Project:	Siltronic / 8	3128.01.08/08	TestCode: NWTPHGX_W									
Sample ID: Client ID:	1502140-004ADUP ZZZZZZ	SampType: <b>DUP</b> Batch ID: <b>R18951</b>	TestCode: <b>NWTPHGX_W</b> Units: μg/L TestNo: <b>NWTPH-G</b> x	Prep Date: Analysis Date: 2/19/2015	RunNo: <b>18951</b> SeqNo: <b>251435</b>							
Analyte		Result	PQL SPK value SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual							
Gasoline		32100	1000	33380	3.93 20							
Sample ID:		SampType: CCV	TestCode: <b>NWTPHGX_W</b> Units: μg/L	Prep Date:	RunNo: <b>18951</b>							
Client ID:	CCV	Batch ID: <b>R18951</b>	TestNo: <b>NWTPH-Gx</b>	Analysis Date: <b>2/19/2015</b>	SeqNo: <b>251436</b>							
Analyte		Result	PQL SPK value SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual							

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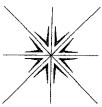
100

Spike Recovery outside accepted recove

- A This sample contains a Gasoline Range Organic not identified as a specific hydrocarbon product. The result was quantified against gasoline calibration standards
- A1 This sample contains a Diesel Range Organic not identified as a specific hydrocarbon product. The result was quantified against diesel calibration standards.
- A2 This sample contains a Lube Oil Range Organic not identified as a specific hydrocarbon product. The result was quantified against a lube oil calibration standard.
- A3 The result was determined to be Non-Detect based on hydrocarbon pattern recognition. The product was carry-over from another hydrocarbon type.
- A4 The product appears to be aged or degraded diesel.
- B The blank exhibited a positive result great than the reporting limit for this compound.
- CN See Case Narrative.
- D Result is based from a dilution.
- E Result exceeds the calibration range for this compound. The result should be considered as estimate.
- F The positive result for this hydrocarbon is due to single component contamination. The product does not match any hydrocarbon in the fuels library.
- G Result may be biased high due to biogenic interferences. Clean up is recommended.
- H Sample was analyzed outside recommended holding time.
- HT At clients request, samples was analyzed outside of recommended holding time.
- J The result for this analyte is between the MDL and the PQL and should be considered as estimated concentration.
- K Diesel result is biased high due to amount of Oil contained in the sample.
- L Diesel result is biased high due to amount of Gasoline contained in the sample.
- M Oil result is biased high due to amount of Diesel contained in the sample.
- MC Sample concentration is greater than 4x the spiked value, the spiked value is considered insignificant.
- MI Result is outside control limits due to matrix interference.
- MSA Value determined by Method of Standard Addition.
- O Laboratory Control Standard (LCS) exceeded laboratory control limits, but meets CCV criteria. Data meets EPA requirements.
- Q Detection levels elevated due to sample matrix.
- R RPD control limits were exceeded.
- RF Duplicate failed due to result being at or near the method-reporting limit.
- RP Matrix spike values exceed established QC limits; post digestion spike is in control.
- S Recovery is outside control limits.
- SC Closing CCV or LCS exceeded high recovery control limits, but associated samples are non-detect. Data meets EPA requirements.
- \* The result for this parameter was greater that the maximum contaminant level of the TCLP regulatory limit.

#### **CHAIN OF CUSTODY RECORD**

		Page_
á	Peale	



Specialty Alialytical				•	JUINA	UL FE	12011/1	riuje				0.16			
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Clackamas, OR 97015					Addre	SS 🎜	001	AJL				Suite 's			
Phone: 503-607-1331												909	<del></del>		
Fax: 503-607-1336					Phon	e C	71	-57	44-	$\mathcal{A}_{1}$	39	Fax_	971-5	344-21	40
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		W - 6					_		Comp			cone of		2/13/15	1300
Unless Reclaimed, Samples Will Be Disposed of 60 Days After Receipt.									Recei	ved F	or Lab B	y:		Date	Time

Samples held beyond 60 days subject to storage fee(s)

# ATTACHMENT D

**DISPOSAL MANIFESTS** 



124	-	e jaint or type. (Form designed for use on elite (12-piloti) typewnter.)						For	n Approved	OMB No.	2050-0030
1		WASTE MANIFEST ORD 0 9 6 2 5 3 7 3 7	2. Page 1 of 2	(877)	rgenny Responsi 818-0087		4. Manifest	096	652	7 V	ES
	G	Generalor's Hame und Mailing Address SILTRONIC/PROJECT 7208 NW FRONT AVE MAILBOX 50 ATTN: K LAIL Generalor's Phone: 503 501-5218 PORTLAND, OR 97210	ļ	SAM		li diferent li	nan ika ing addos	क्ष			
		Transporter I Company Name EOLIA ES TECHNICAL SOLUTIONS					U.S. EPAID N		лкз	1 3	6 0
		Transporter 2 Company Name					US, FFAIDA	2 5	· · · ·	1 2	0 3
		AVANNAH TRAHSPORT					K S O		0 3 3	6 B	9 i
		Ocsignated Facility from and Sac Address VEOLIA ES TECHFICAL SOLUT HIGHWAY 73 1.5 MILES W. OF TAYLOR'S BAT PORT ARTHUR, TX 77640					N CIAPA B U				
		icida kucios: dud. 120-5471			10 Cooks		TXD		0 8 3	8 8	ġ ť
	H	W mich, signal (yearly);			10. Contain No.	Туре	11 Total Overnity	12 Urk ivi Mas	t3	Westa Code	) j
ATOR -	)	NAJ061 HAZARDOUS WASTE, LIQUID, n.o.s., (VINY) CHLORICE TRICHLORGETHERE), 7, 111	Ĺ	ja:	5	T P	12500	р	F002	D849 OUTSI	D043
GENERATOR	-	2					18300	1	5071	Odital	7111
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		3.									
		4				,			171 may 16 feb. 1 1 feb		
	14	Special Handling Instructions and Additional Information ER Service Contra		(FCT)	ים לו ו	2-171 70	71.027				
	15.	GENERATOR'S/OFFEROR'S CERTIFICATION: I heraby declars that the contents of this commarked and labeled/placerded, and are in all respects in proper condition for transport accord Exporter, I carrify that the contents of this configuration conform to the terms of the stacked Exporter, I carrify that the waste true mission statement identified in 40 CPR 202 27(a) (if I am a large of	ing to applic EPA Acknowl quantity gare	able inter edgment rator) or	national and rails of Consent.	anal grivema	nancal regulations	n extori ep	ipment and I	am the Prim	ery
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	1	HD40 1°	,				•,		<u>-</u>		
1 6		calgrated F, citiy Owner or Operator Certification of receipt of hazardous materials covered to			as noted in Hem	18a					
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and the back and the	nt or type. (Form designed for use on allte			,			n Approved	OMB N	. 2050-00
UNIF	ORM HAZARDOUS WASTE MANIFEST	21 Generalor ID Number ORD 0 9 6 2 5 3 7 3 7	22. Page 2 of 2	23, Man	feet Tracking Nu		31 75781		
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278	27b. U.S. DOT Description (including Proper Shi	poing Name, Hazard Class, ID Number.	28. Contal	nera	29 Total	30, Undi			
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Generator Name _SILTRONIC/PROJE	CT
EPAID Number ORDX096253737	Manifest 000966527VES
restricted from land disposal by the USEX each container is the designation of the wa- permit status associated with the treatmen	te with 40 CFR 268.7 to inform you that this abipment contains waste A under the land disposal restriction program. Identified below for uste as a wastewater or non-wastewater, the Clean Water Act (CWA) thisposal facility, applicable waste codes and any corresponding and constituents that are present in the waste, and any underlying sent.
Container Number QI-2129459598-001	(1/-1)
WIP / Approval Code:	071087 / PTA071087
Form Designation / CWA Status	Non-Wastewater / Non-CWA
Waste Codes (Subcategories):	D040, D043, F002, F037
Constituents (F001 - F005).	DISPOSAL SITE MONITORS FOR ALL CONSTITUENTS
UFECa Present:	BENZENE, TOLUENE (NON F-LISTED) Restricted waste requires treatment to applicable stands
Trestment Requirements: Additional Mouces:	Regulaten waste tedrilles nearment to abbitcome stato
I hearby certify that all information in this accurate to the best of my knowledge and Signature Low Accounts	s and associated land disposal restriction documents is complete and information.
Title Any Chipie	Date 3/4/15

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	5. G	cencrator's Nauro and Mailing Address SILTROPSIC/PROFICT		Generator's Sile Addr	i inersițib li) aas	erban gallam nad	3)			
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		anaporter 1 Company Name				US EPAID N	เกาส์เล้า			
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		perist Handing Instructions and Additional Information								
	14.0	peasing instructions and Assettors information	racted by '	VESTS - - 1) I	RG:171 W	7:71087				
	16.	GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this reprised and ishelectiples aded, and are in all respects in proper condition for transport are:	consignment a	re fully and accurately able international and	describaciation	c by the proper shi nental regulations.	if cyport st	e, and are cla	reifled, pack	egad,
	1	Experien, Lentilly that the contents of this consignment conform to the terms of this attached Lentify that the waste minimization statement identified in 40 CFR 282.27(a) ( $d$ Lentillary statement identified in 40 CFR 282.27(a) ( $d$ Lentillary statement identified in 40 CFR 282.27(a))	FPA Ackrown	engment of Consem.						
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SILTRONICIPROJECT

Generator Maine

EPA ID Number ORD095253737	ħ,īs	mifest	000066526VES
This notice is being provided in accordant restricted from land disposal by the USES each container is the designation of the way permit status associated with the treatment subcategories, list of any FOO1-FOO5 solve hazardous constituents (UEC) that are provided in according to the same provided in accordance in accordanc	PA under the land disposal nes aste as e wastewater or non-w st/disposal facility, applicable ant constituents that are prese	striction Pastewal B waste	i program. Identified below for ter, the Clean Water A.c. (CWA) codes and any corresponding
Container Number QI-2189459999-001	(1) 1)		
V/IP / Approval Code: Form Designation / CWA Status Waste Codes (Subcategories): Constituents (F001 - F005). UHCs Present: Treatment Requirements Additional Motices	BENZENE, TOLUENE (	7 TORS (NON F	FOR ALL CONSTITUENTS LISTED) atment to applicable standards.
I hearby certify that all information in the securate to the best of my knowledge and Signature Signature Signature Signature	information		tion documents is complete and

Form Approved. OMB No. 2050-0039 Please print or type. (Form designed for use on elite (12-pitch) typewriter.) 4. Manifest Tracking Number 0009665 1. Generator ID Number 2. Page 1 of 3. Emergency Response Phone UNIFORM HAZARDOUS **WASTE MANIFEST** <del>(877)</del> 818-0087 ORD 0 9 6 2 5 3 7 3 7 Generator's Site Address (if different than mailing address) 5. Generator's Name and Mailing Address SILTRONIC/PROJECT 7200 NW FRONT AVE MAILBOX 50 ATTN: K LAIL SAME Generator's Phone: 503 501-5218 PORTLAND, OR 97210 U.S. EPA ID Number 6. Transporter 1 Company Name N J D 0 8 0 6 3 1 3 6 9 veolia es technical solutions U.S. EPA ID Number 7. Transporter 2 Company Name SAVANNAH TRANSPORT KS0000336891 8. Designated Facility Name and Site Address
VEOLIA ES TECHNICAL SOLUTIONS
HIGHWAY 73
3.5 MILES W. OF TAYLOR'S BAYOU U.S. EPA ID Number PORT ARTHUR, TX 77640 T X D 0 0 0 8 3 8 8 9 6 Facility's Phone: 409 736-2821 9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, 10. Containers 9a. 12. Unit 13. Waste Codes and Packing Group (if any)) НМ Quantity Wt./Vol. No. NA3077, HAZARDOUS WASTE, SOLID, N.O.S. (TRICHLOROETHYLENE, BENZENE), 9, III, RQ (F002) FU02 X GENERATOR DM p F037 OUTSMOLH とのなって 14. Special Handling Instructions and Additional Information ER Service Contracted by VESTS -|- 1) ERG:171 W:541996 GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent. I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true. Day Year Month nren 16. International Shipments Import to U.S. \_ Export from U.S. Port of eatry/exit: Date leaving U.S. Transporter signature (for exports only): 17. Transporter Acknowledgment of Receipt of Materials ter 1 Printed/Typed Name Month Day Year 18. Discrepano 18a. Discrepancy Indication Space \_\_Type Residue Partial Rejection Full Rejection Manifest Reference Number: 18b. Alternate Facility (or Generator) U.S. EPA ID Number بي كذم Facility's Phone: 0 Year 18c. Signature of Alternate Facility (or Generalor) Day Menth 19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems) 20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a Printed/Typed/Na rear, Month

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO GENERATOR STATE (IF REQUIRED)

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Manifest Doc. No.: 00090652UES

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OR325002

State Manifest No: \_\_\_\_

chis waste a non-wastewater or wastewater? (See 40 CFR 268.2) Check ONE: Nonwastewater X Wastewater zentify ALL USEPA hazardous waste codes that apply to this waste shipment, as defined by 40°CFR 261. For each waste code, identify the corresponding subcategory, or check NONE if the waste code has no subcategory. Spent solvent treatment standards are listed on the following page. If F039, multi-source leachate applies, those constituents must be listed and attached by the generator. If D001-D043 requires treatment of the characteristic and meet 268.48 standards, then the underlying hazardous constituent(s) present in the waste must be listed and attached. and attached

REF	3. US EPA HAZAROOUS WASTE CODE(S)	4. SUBCATEGORY ENTER THE SUBCATEGORY DESCRIPTION. IF NOT APPLICABLE, SIMPLY CHECK NONE			
#		DESCRIPTION NO	NE	FROM BELOW	
1	F037	organics		A	
2	F037	metals		D	
3	F037	cyanide		D	
4	F002			A	

To identify F039 or D001-D043, underlying hazardous constituent(s), use the F0397Underlying Hazardous Constituent form" provided (CWM-2004) and check here:

If no UHCs are present in the waste upon its initial generation check here: X

To list additional USEPA waste code(s) and subcategorie(s), use the supplemental sheet provided (CWM-2005-D) and check here:

Disposal facility monitors for all UHCs check here

If waste will be managed in a system regulated under the CWA, or a Class 1 injection well under the SDWA check here

HOW MUST THE WASTE BE MANAGED? In column 5 above, enter the letter (A, Bl. B3, B4, B5, B6, C. D or E) below that describes how the waste must be managed to comply with the land disposal regulations (40 CFR 268.7). Please understand that if you enter the letter Bl. B3, B4, B5, B6, or D you are making the appropriate certification as provided below. (States authorized by EPA to manage the LDR program may have regulatory citations different from the 40 CFR citations listed below. Where these regulatory citations differ, your certification will be deemed to refer to those state citations instead of the 40 CFR

regulatory citations differ, your certification will be deemed to release to the acceptance of the control of the control of the applicable treatment standards set forth in 40 CFR 268.40.

RESTRICTED WASTE REQUIRES TREATMENT

This waste must be treated to the applicable treatment standards set forth in 40 CFR 268.40.

For Hazardous Debris: "This hazardous debris is subject to the alternative treatment standards of 40 CFR 268.45."

BIT RESTRICTED WASTE TREATED TO PERFORMANCE STANDARDS

"I certify under penalty of law that I have personally examined and am familiar with the treatment technology and operation of the treatment process used to support this certification. Based on my inquiry of those individuals immediately responsible for obtaining this information. I believe that the treatment process has been operated and maintained properly so as to comply with the treatment standards specified in 40 CFR 268.40 without impermissible dilution of the prohibited waste. I am aware there are significant penalties for submitting a false certification. including the possibility of fine and imprisonment."

3 GOOD FAITH ANALYTICAL CERTIFICATION FOR INCINERATED ORGANICS

"I certify under penalty of law that I have personally examined and am familiar with the treatment technology and operation of the treatment process used to support this certification. Based on my inquiry of those individuals immediately responsible for obtaining this information. I believe that the nonwastewater organic constituents have been treated by combustion in units as specified in 268.42 Table 1. I have been unable to detect the nonwastewater organic constituents law aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment."

3 ACCUMPACTERIZED WASTE REQUIRES TREATMENT FOR UNDERLYING HAZARDOUS CONSTITUENTS

organic constituents despite having used best good faith efforts to analyze for such constituents. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment."

8.4 DECHARACTERIZED WASTE REQUIRES TREATMENT FOR UNDERLYING HAZARDOUS CONSTITUENTS
"I certify under penalty of law that the waste has been treated in accordance with the requirements of 40 CFR 268.40 or 268.49, to remove the hazardous characteristic. This decharacterized waste contains underlying hazardous constituents that require further treatment to meet treatment standards. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment."

8. RESTRICTED DEBRIS TREATED TO A LIERNATE PERFORMANCE STANDARDS
"I certify under penalty of law that I have personally examined and am familiar with the treatment technology and operation of the treatment process used to support this certification and believe that it has been maintained and operated properly so as to comply with treatment standards specified in 40 CFR 268.45 without impermissible dilution of the possibility of fine and imprisonment."

8. RESTRICTED WASTE SUBJECT TO A VARIANCE This waste is subject to a national capacity variance, a treatability variance, or a case-by-case extension. Enter the effective date of prohibition in column 5 above.

8. PORTICIED WASTE CAN BE LAND DISPOSED WITHOUT FURTHER TREATMENT

8. This waste is subject to a national capacity examined and am familiar with the waste through analysis and testing or through knowledge of the waste to support this certification that the waste comples with the treatment standards specified in 40 CFR Part 268 Subpart D. I believe that the information I submitted is true, accurate and complete. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment."

8. WASTE IS NOT CURRENTLY SUBJECT TO PART 268 RESTRICTIONS

Thi

I hereby certify that all information submitted in this and all associated documents is complete and accurate, to the best of my knowledge and information.

Signature Kritol

Of Stanic Title Env. Engri 1990 Linemical Waste Management . Inc. - 08/993 Form CWM-2005-C

#### SOLVENT

If the waste identified on the first page of this form is described by any of the following USEPA hazardous waste codes: F001, F002, F003, F004, F005, and all solvent constituents will not be monitored by the treater, then each constituent MUST be identified below by checking the appropriate box, and this page must accompany the shipment, along with the previous page of this form. If the waste code F039 describes this waste, then the corresponding list of constituents must be attached. If D001-D043 require treatment to 268.48 standards, then the underlying hazardous constituent(s) must also be attached.

		SOLVENT WASTE TREATMEN	NT STANDARDS <sup>2</sup>	
-	FOUL through FOUS spent solvent constituents and their associated USEPA hazardous	Treatment Standard	FUUL through FUUS spent so!- vent constituents and their associated USEPA hazardous	Treatment Standard
	waste code(s).	Wastewaters   Nonwastewaters		Wastewaters   Nortwastewaters

All spent solvent treatment standards are measured through a total waste analysis (TCA), unless otherwise noted. Wastewater units are mg/l, nonwastewater are mg/kg.

For contaminated soils using the alternative soil treatment standards, the treatment standards for F001-F005 spent solvents must be a 90% reduction of constituents or less than 10 x the standards listed.

#### SUBCATEGORY REFERENCE

D001:
A. Ignitable characteristic wastes, except for the 40 CFR 261.21(a)(1) High TOC subcategory.
B. High TOC Ignitable characteristic liquids subcategory based on 40 CFR 261.21(a)(1) - Greater than or equal to 10% total organic carbon.

1990 Chemical Waste Management . Inc. - 08/99 - Form CWM-2005-C

No.   Type   Chantity   Wi.Vol.	U.S. EPA ID Number  WADY  U.S. EPA ID Number  U.S. EPA ID Number  11. Total 12. Unit Quantity Wt./Vol. 13. Waste Codes	U.S. EPA ID N U.S. EPA ID N U.S. EPA ID N U.S. EPA ID N																
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7. Transporter 2 Campainy Name  8. Designated Facility Anne and S to Address  U.S. EPA ID Number  8. B. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, No. Type Quantly Vt. Vol. 12. Until Vt. Vol. 13. Washs Co. 13. Sp. 13.	U.S. EPA ID Number  U.S. EPA ID Number  11. Total Quantity	U.S. EPA ID N U.S. EPA ID N																
8. Designated Facility Name and S is Address  U.S. EPA ID Number  Facility's Phone:  9. 8 B. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, 10. Containers 11. Total 12. Unit 12. Unit 13. Waste Co. 14. Special Handling Instructions and Additional Information  14. Special Handling Instructions and Additional Information  15. GENERATOR'SIOFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described shove by the proper shipping name, and are classified, primarised and labeledgibilizationed, and rise in all respect in proper controllor for transport according to applicable international and railward genommental regulations. If export chrisment and if an the P Export of the Control of the terms of the statististic EPA-Advance/generated Classifications and Additional Regulations. If export chrisment and an the P Export of Control of the Control o	U.S. EPA ID Number  11. Total Quantity	U.S. EPA ID N																
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20. Designated Facility Owner or Operator. Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a	4.	4.					1											

Generator Name	SILTRONIC/PROJE	ECT		Population in the part of the Control of the
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4	UNIFORM HAZARDOUS 1. Generator ID Number 2. Page 1 of 3.					ponse Phone	4. Manifest Tracking Number				
П	WASTE MANIFEST	OR1309	0253747	1	(877) 818-00	137	100	Uyb	6523	VES	
	5. Generator's Name and Mailing Address SILTRONIC/PROJECT Table 100 FRONT AVE MAILBOX 50 ATTN: K LACL Generator's Phone: \$03 501-3318 PORTLAND, OR 97310  Generator's Name and Mailing Address Generator's Site Address (if different than mailing address)  SAME  PORTLAND, OR 97310										
Ш	Generator's Phone: 303 31.	11-2318 2010	Theatres, with Figure				II O EDAIDA				
Ш	6. Transporter 1 Company Nam		127.7				U.S. EPAID N		1 6 1 1		
П	VEOLIA ES TECHNI		2012						1, 41 7 7	3 3 3/	
	7. Transporter 2 Company Nam		U.S. EPA ID N	lumber							
	Designated Facility Name an	d Site Address	U.S. EPA ID N	lumber							
	Facility's Phone: 541 45		15 8 5	11 8	8 4 5 3	1 1 1					
	HM and Packing Group (if a	any))	hipping Name, Hazard Class, IC	Number,	10. 0 No.	Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste	Codes	
GENERATOR -	HASOT HAS GENEENE 1	Zandous un Bichlohöe	STE SOLID n.a.s. Hylene, 9, 111			DF	68	7 : 12 /	F017		
- GENE	2.		44	, .		Arre-3-1	<i>PD</i> .				
	3.										
	4.										
	14. Special Handling Instruction	s and Additional Inform	nation 1777 Carrei	ie Contracted by	177777 1 1:	771772 1-71 371	.771 1 O -1 3 757	. ******** 4	4.77		
	15. <b>GENERATOR'S/OFFEROR'S CERTIFICATION:</b> I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.  I certify that the waste minimization statement identified in 40 CFR 262 27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.  Significant of Consents of Consents of the contents of the attached EPA Acknowledgment of Consents of the attached EPA Acknowledgment of Consents of the attached EPA Acknowledgment of Consents.										
Ш	Generator's/Offeror's Printed/Ty			Sig	nature	101	Cal		Month	Day Year	
\	Koreen	Callen		10	THE CONTRACTOR	cel by	Siphu	31-12-	Sec.	415	
INT	16. International Shipments  Transporter signature (for expo	Import to U	.S.	Export from U	J.S. Por	t of entry/exit		, A			
R.	17. Transporter Acknowledgmen	nt of Receipt of Materia	S								
TRANSPORTER	Transporter 1 Printed/Typed Na Transporter 2 Printed/Typed Na	ne b	1010		nature nature	time B	WILL		Month   O O	Day Year Day Year	
-	18. Discrepancy										
	18. Discrepancy  18a. Discrepancy Indication Space Quantity  Type Type Chron Brown Full Rejection  Manifest Reference Number:										
FACILITY	18b. Alternate Facility (or General	U.S. EPA ID N	lumber								
FAC	Facility's Phone:		1								
DESIGNATED									Month	Day Year	
5	19. Hazardous Waste Report M	anagement Method Co	odes (i.e., codes for hazardous	waste treatment disposa	I, and recycling syste	ems)					
- DES	1 4132			3.	,,,,,		4.				
	20. Designated Facility Owner of	or Operator: Certification	on of receipt of hazardous mate	rials covered by the mani	fest except as noted	in Item 18a					
	Printed/Typed Name	16180	ſ		nature		0.600-		Month	Day Year	



1		HIPPING OCUMENT	1 Generator ID Number  ORD 0 9 6 2 5 3 7 3 7	2 Page 1 of	(877) 818-0187	Phone	4 Shipping I	Z 0	0426577			
	5 (	Generator's Name and Marin	SILTRONIC CORPORATION 7200 NW FRONT AVE		Generator's Site Address SAME	if different th	an mailing addres	s)				
	Ge	MAILBOX 50 ATTN K LAIL  Generator's Phone 503 219-7832 PORTLAND, OR 97210-2676										
	6 VE	6 Transporter 1 Company Name         U.S. EPAID Number           VEOLIA ES TECHNICAL EQUUTIONS         N. J. D. 0. 8. 0. 6. 3. 1. 3. 6. 9										
	7 Transporter 2 Company Name  CHEMICAL WASTE MGMT OF NW US EPA 10 Number  ORD 089452353											
	8 (	Designated Facility Name and	d Sae Address CHEM WASTE MGT OF NORT!	HWEST			U.S. EPAID N					
			17629 CEDAR SPRINGS LANE ARLINGTON, OR 97812									
	Fa 9a	9b U.S. DOT Description	on (including Proper Shipping Name Hazard Class, ID Number		10 Contain	9 4 5 2 3 5 3						
	Hi.	and Packing Group (if a	any))		No.	Туре	11 Total Quantity	12 Unit Wt /Vol	13. Codes			
ATOR		· NON HAMAR	DOUS MATERIAL		17	D M	4926	ם	X004			
GENERATOR	_	2				5 111	7100	A				
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	-	3										
			0.0									
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	14	Spacial Handling Instruction	ns and Additional Information FD Sagrice Com									
	ľ	openin running account	ER Service Con	tracted by	VESTS - - 1) W	/10387 A	IRL OR3250	543				
	15		OR S CERTIFICATION: Thereby declare that the contents of the					pping name	a and are classified packaged			
	Ge	Boren I	ped Name	ke	gnaturi	201	da Si	Acon	Month Day Year			
ILL		mternational Shipments	Import to U.S	Export from			1		21317170			
_	17	ansporter signature (for expo Transporter Acknowledgmen	nt of Receipt of Shipment		Date leavi	ng U S						
TRANSPORTER	7	rsporter 1 Printed/Typed National No.	Brown	Si	Christi	o B	MALIN		Month Day Year 103104115			
RANS	Tra	enspecter 2 Printed Typed Na	me	Si	ignature	2	/	/	Month Day Year			
F	18	Discrepancy	- Whitman		hand	0	de dito	· ·	03 18 15			
	18.	a Giscrepancy Indication Spa	ace Quantity Type		Residue		Partial Reje	ection	Full Rejection			
	40	b Alternate Facility (or Gener			Shipping Documen	Tracking Nu	mber U.S. EPA ID N	lumbro.				
FACILITY	10.	a Alternate Faculty (or Gener	atory				U.S. EPAIDIN	umber	-			
D FA	Fa 18	cility's Phone c Signature of Alternate Faci	ikty (or Generator)						Month Day Year			
SNAT												
DESIGNATED	19	Report Management Metho	d Codes (i.e. codes for treatment, disposal, and recycling syste	ems)			4					
ı		MISA Designated Facility Output	or Operator Certification of receipt of shipment except as noted	Lin Ham 182	^							
		inted/Typed Name	1.	-	ignau		. 7.		Month Day Year			
F	1	lina U	Jesser		year	U	DIA		13 19 15 D FACILITY TO GENERATOR			
1)	5/	<b>50</b> 0					DESI	MINIE	A LAURENT TO GENERALO			